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COMMENTS ON SAUGET AREA 2 HAZARD RANKING SYSTEM LISTING DOCUMENT

December 13, 2001

Prepared for AmerenUE, St. Louis, MO

Prepared by NewFields

NEWFIELDS

Table of Contents:

The review provided in this report is based in large part on a comprehensive electronic data base developed from documents from the US EPA files. This includes all the data available in the Administrative Record for the NPL Listing document as well as data from other US EPA actions in the area. The data sources are listed below.

Mapping of the pattern of chlorobenzene contamination throughout Area 1 and 2 is included in this report to demonstrate critical points regarding potential inaccuracies in the US EPA's assumptions. Chlorobenzene was used as an indicator parameter that demonstrates relevant patterns of groundwater contamination.

A CD attached to this report contains an Access database. (Exhibit 44) A list of data sources is also included. The CD contains the coordinates for each sampling point, the chlorobenzene concentrations, and the reference from which the data was obtained.

INTRODUCTION

Objective

On behalf of Union Electric Company dba AmerenUE, this document provides comments on the US Environmental Protection Agency's (US EPA) September 13, 2001 National Priorities List (NPL) proposed listing of Sauget Area 2. (Exhibit 1) The document provides an examination of the available data, US EPA's interpretation of that data in the NPL site listing assessment, and the appropriateness of US EPA's NPL listing conclusions. This document is not directed at the proposed Sauget Area 1 NPL listing.

The available data demonstrate that the sources combined by US EPA into Area 2 should not be aggregated into a single source for NPL listing purposes. US EPA did not appropriately follow Agency guidance and criteria in its aggregation of sources. Further, the available data do not support NPL inclusion of several of the individual sources either within Area 2 or as independent sites.

Specifically, this document demonstrates the following:

1) US EPA's Conceptual Site Model of source aggregation for Hazard Ranking System (HRS) scoring purposes is not supported by the data or physical characteristics of the area.

2) The landfill identified as Site P cannot be aggregated with other sites in Area 2. Site P does not share geographic proximity, similar waste types, or common exposure pathways with any of the other Area 2 sites.

3) Site P, when considered independently, does not qualify for the NPL.

4) The area identified by US EPA as Site Q has not been clearly defined.

5) An area of coal ash ponds, a landfill, and drum burial pits, collectively labeled as Site Q by the US EPA, is in fact three distinct areas. The three areas do not have similar waste types or common exposure pathways.

6) The central portion of Site Q was not appropriately scored according to US EPA's Hazardous Ranking System guidance.

Site History

Area 2, as currently defined by the US EPA, is an aggregation of five potential contaminant source areas within the Dead Creek Project (DCP) area located in the Village of Sauget and Cahokia in west-central St. Clair County, Illinois (Figure 1). (Exhibit 2) The entire DCP area consists of 13 suspected uncontrolled hazardous waste sites and six segments of Dead Creek. The sites have been grouped into two areas (Area 1 and 2) for Hazard Ranking System scoring purposes (Figure 1). The grouping was based on Illinois EPA (IEPA) and US EPA interpretation of geographical relationship, ownership, operation, waste types, and exposure pathways. (Exhibit 3)

The Village of Sauget is in the floodplain across the Mississippi River from St. Louis, Missouri. (Exhibit 4) The area has been used for industrial activities since the 19th century. One of the first factories in the area was the Commercial Acid Company, which manufactured sulfuric acid, zinc chloride, chlorosulfonic acid and sodium sulfate. The plant was purchased by Monsanto Chemical Company (Monsanto) and renamed the William G. Krummrich plant in 1952.

Some of the other major industrial facilities that have operated in the area include:

- Amax Zinc, Inc. (now Big River Zinc)
- American Bottoms Wastewater Treatment Plant
- Cerro Copper
- Clayton Chemical
- Edwin Cooper (formerly Ethyl Petroleum)
- Midwest Rubber
- Mobil Oil Refinery
- Moss-American
- Phillips Petroleum Terminal
- Sauget Wastewater Treatment Plant
- Trade Waste Incinerator

The Krummrich plant added new facilities for producing phenol and chlorobenzenes in the 1950s and 60s. (Exhibit 4) The Krummrich plant eventually became the world's largest integrated chlorobenzene manufacturer. The plant has manufactured a wide variety of chemicals including polychlorinated biphenyl (PCB) compounds. Throughout the plant's operation, waste generated at the facility has been disposed within the property boundaries and in various landfills throughout the area. Solutia, Inc. now operates the Krummrich plant.

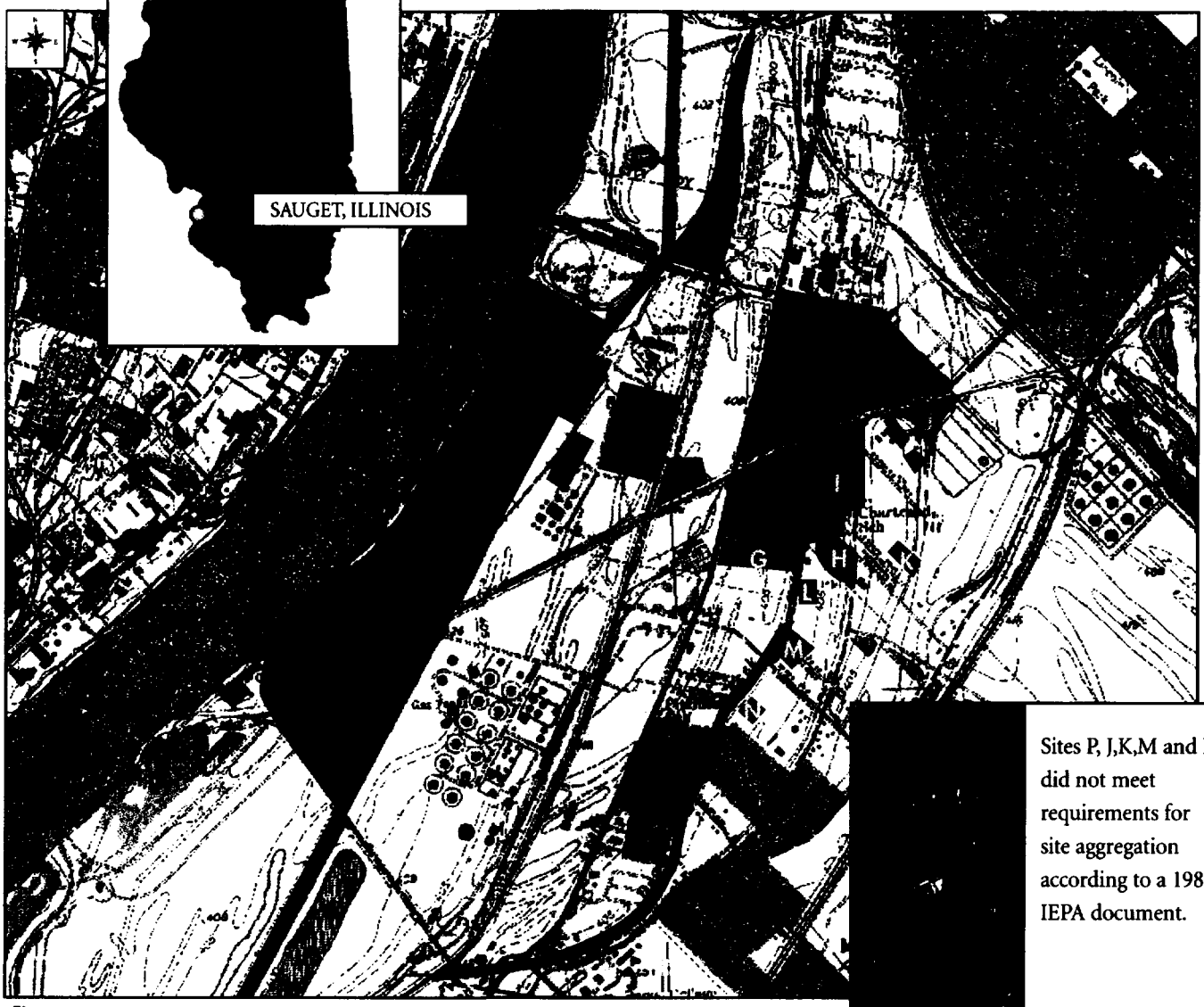


Figure 1

Site Divisions

The scope of work submitted to the IEPA by Ecology and Environment in August of 1986 suggested grouping various disposal sites together into two areas for Hazard Ranking System (HRS) scoring purposes. (Exhibit 3) A brief description of each area is provided below. Five of the sites, J, K, M, N, and P, did not meet requirements for site aggregation and, as of 1988, were referred to as peripheral sites by IEPA.

DESCRIPTION OF SOURCES AGGREGATED BY THE U.S. EPA INTO AREA 2

R

Site R: (25 acres) (also known as the Sauget Toxic Dump and Krummrich Landfill) This area is an inactive industrial waste landfill bordered by the Mississippi River (Figure 2). (Exhibit 3) From 1957 to 1977, Monsanto disposed of liquid and chemical wastes including chlorinated compounds such as PCBs. (Exhibit 5) Sauget and Company operated the Krummrich Landfill on behalf of Monsanto. Site R is currently covered with a clay cap and vegetation with drainage directed to ditches around the perimeter of the site. (Exhibit 1) Access has been restricted by a fence and 24-hour camera surveillance since 1978.

Figure 2

Q

Site Q: (225 acres) The boundary of Site Q, as defined by US EPA in the NPL listing document, is shown in Figure 3. (Exhibit 1) Site Q is located south of the former Cahokia Power Plant and west of an Army Corps of Engineers (ACOE) flood control levee. From approximately 1949 to 1974, Union Electric Company operated, on the western edge of Site Q, a series of ash impoundments. (Exhibit 6) The ash ponds covered approximately 32 acres along the Mississippi Riverbank. Union Electric operated the ponds as a monofill, accepting only combustion related wastes from the Cahokia Power Plant. No landfilling occurred within the ash ponds.

Figure 3
Alton & Southern Railroad Company

Commencing in 1966 and continuing until the mid-1970s, Sauget and Company conducted unpermitted landfill operations in Northern Site Q, an area immediately east of Site R know as the dogleg or panhandle of Site Q. (Exhibit 1,2) This landfill has been referred to alternatively as the Sauget Municipal Landfill (Exhibit 6) or the Sauget Landfill. (Exhibit 2) In addition, Sauget and Company apparently operated an unpermitted landfill in the southern region of Site Q near the Alton and Southern Railroad lines. The ash ponds and the landfill areas were operated separately and are geographically discrete. Aerial photography reflects that vast portions of Central Site Q were not used for disposal activities. (Exhibit 7) Site Q should be subdivided into separate regions to more accurately reflect its operational and disposal history. It is not, as described by US EPA, an inactive, 225 acre landfill.

US EPA's characterization of Site Q is based on mistaken assumptions that lack appropriate supporting data. For example, The Ecology and Environmental Report states that "Contamination was detected across the entire area investigated, which suggests that disposal of large quantities of chemical wastes occurred specifically in the northern portion of Site Q and probably over the entire area." (Exhibit 8, page 80, 87) Neither the administrative record nor the empirical data support such a conclusion. In fact, the Central Site Q samples did not detect contamination approximating that detected in the Sauget Municipal Landfill in the northern portion of Site Q. (Exhibit 9) Moreover, historical aerial photographs dating from the early 1950's to the present confirm that there were no significant waste disposal activities within most of Central Site Q. (Exhibit 17) Without data to support the above statement, the conclusion can be described only as baseless speculation. This speculation led to unrelated areas being erroneously combined into a single large site (Figure 4).

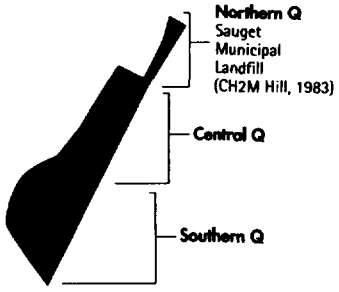


Figure 4

Figure 5

P

Site P: (28 acres) This region is an inactive, permitted sanitary landfill known as the Sauget-Monsanto Landfill. In 1988, IEPA determined Site P did not meet the requirements for aggregation. (Exhibit 3) Site P is a triangular parcel located east of the 500-year ACOE flood control levee and north of the other Sauget Area 2 sites (Figure 5). (Exhibit 1) Site P began operating as a non-chemical solid waste disposal facility for Monsanto in 1973. In 1974, Sauget and Company was granted a permit to also accept diatomaceous earth filter cake from Edwin Cooper, Inc. Site P is bordered on the west by the Illinois Central Gulf Railroad and on the east by the Terminal Railroad Association.

Figure 6

S

Site S: (11 acres) This area is located approximately 100 feet west-southwest of Site O (Figure 6). (Exhibit 1) The site is covered primarily with gravel but a small portion is covered by an asphalt parking lot and driveway. Aerial photographs available from 1973 and 1975 show drum disposal operations occurring in this area. There is no specific information on the contents of the drums seen in the aerial photographs, but sampling has detected pesticides and volatile organic compounds (VOCs) in soil.

Figure 7

O

Site O: (20 acres) This area consists of four inactive sludge dewatering lagoons used by the Village of Sauget Wastewater Treatment Plant (WWTP) from 1966 to 1978. (Exhibit 5) Ninety-five percent of the wastewater was generated by local industries with Monsanto contributing approximately 80% of the industrial volume. Site O is located west of the Krummrich plant and east of the ACOE flood control levee (Figure 7). In 1978 the lagoons were closed and covered with two feet of clay and subsequently vegetated.

US EPA'S CONCEPTUAL SITE MODEL IS INACCURATE.

The aggregation of alleged sources into Area 2 is not justified by the data. Sources in the Dead Creek Project area are related along an east-west axis. The primary source of alleged risk to the Mississippi River is a groundwater contaminant plume that extends from the Krummrich plant to the Mississippi River.

The concept of grouping several sites and creek sectors together for future Hazard Ranking System (HRS) scoring purposes was introduced in a scope of work revision submitted to IEPA by Ecology and Environment in August 1986. (Exhibit 3) The criteria used for their Conceptual Site Model (CSM) grouping, according to the Ecology & Environment Expanded Site Investigation Report of 1988, was geographical relationship, ownership and operation, waste types, and common exposure pathways. Each subsequent US EPA and IEPA report used the 1986 CSM without reassessing the model's validity relative to new data.. The CSM currently used by the US EPA consists of the two separate CERCLA sites (Area 1 and Area 2).

The Agency criteria provide guidance for grouping sites in a manner that enhances the management of contamination, risk pathways, and remediation. (Exhibit 10) The goals of the NPL are best served if common pathways, components, and/or threats are grouped and examined in a comprehensive manner. US EPA has identified the pathways of concern as surface water overland/flood migration and/or groundwater to surface water migration. (Exhibit 1) As such, the CSM should be based on knowledge of the source, the target of these risk pathways and should thoroughly describe the pathways.

The US EPA's CSM fails to satisfy its own stated criteria for grouping sites, and it fails IEPA criteria as well. Some of the sources grouped into Area 2 are geographically separate, the waste types are not common among all the sources, and all the sources do not share common exposure pathways and targets.

The US EPA's attempt to combine and portray these sites as a single area, and their delineation of a pathway of concern (groundwater), is included in the NPL listing document and reproduced here (Figure 8). (Exhibit 1) However, the US EPA representation of the "groundwater plume" does not correctly describe actual contaminant distribution.

The contaminant distribution data demonstrate that the principal risk pathway to be managed is in fact a groundwater plume migrating from east to west from the Krummrich Plant, under a drum disposal area and then under Sites O, S, Northern Site Q and Site R (Figure 9). (Exhibit 11) Contaminants from each of these locations commingle as groundwater migrates toward the Mississippi River. There is no factual basis for US EPA's apparent suggestion of a southwestern groundwater migration path.

The true characteristics of the groundwater plume can be demonstrated with the indicator parameter, chlorobenzene. A post plot of chlorobenzene concentrations is shown in Figure 9. (Exhibit 11)

Based on the information provided in the Area 2 NPL listing document, and the figures included within the listing document, it does not appear the US EPA has ever performed a comprehensive analysis and visualization of groundwater contaminant distribution throughout the DCP. As such, the US EPA CSM of contaminant distribution is an artificial construction based on untested assumptions that date back to 1986 or earlier. Superimposing the US EPA-defined groundwater plume onto the contaminant plume data illustrates the inadequacy and inappropriateness of the US EPA delineation and CSM (Figure 9). The discrepancy between the US EPA CSM and the true conditions at the site is apparent on the following pages.

The distribution of contamination shown in Figure 9 does not support the US EPA estimate of the plume shape or dimensions shown in Figure 8. This US EPA groundwater plume is drawn to connect each of the source areas combined fifteen years ago into Sauget Area 2.

The following pages provide additional support for the conclusion that the US EPA CSM and resultant grouping of sites into Area 2 is fundamentally flawed for NPL listing assessment, effective risk management, and remedial decision-making.

Figure 9

US EPA plume boundary estimate

LEGEND:
GW-Chlorobenzene (ug/l)

- < MCL**
- > MCL
- Dead Creek

***Chlorobenzene is utilized as an indicator parameter*
MCL = 100 ppb

EPA NATIONAL PRIORITIES LISTING DOCUMENT

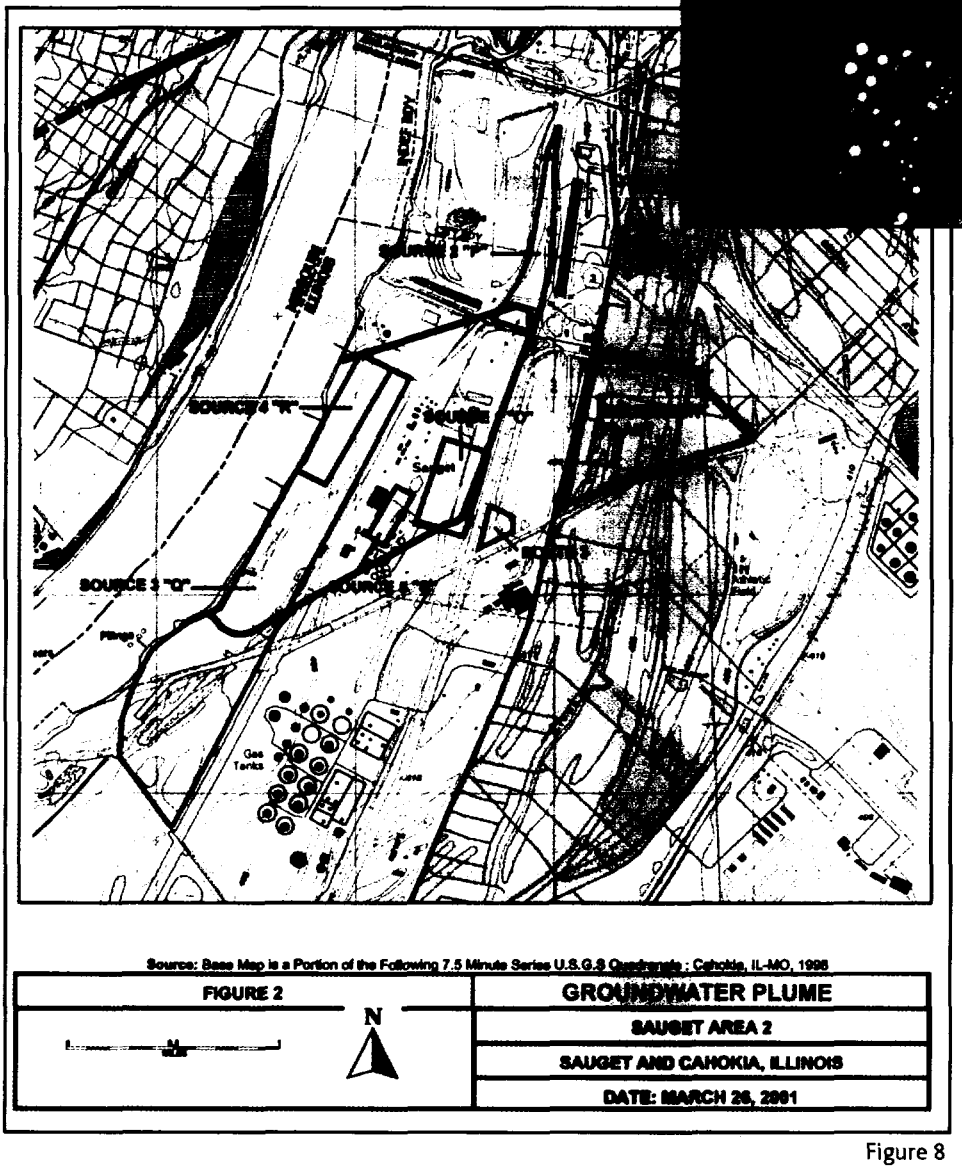


Figure 8

A close analysis of the vertical distribution of the groundwater contaminants supports the conclusion that the US EPA CSM is inappropriate. The data demonstrate that multiple disconnected shallow contaminant sources are leaching into and commingling in a continuous deeper groundwater plume. This deeper groundwater plume is bounded on the north and south by the approximate limits of Site R (Figure 11). (Exhibit 11) Several alleged sources currently grouped into Area 2 are south and north of the plume. These alleged sources (Central Site Q, Southern Site Q and Site P, respectively) are completely unrelated to the principal groundwater to surface water risk pathway.

The commingling of contamination is apparent from deep groundwater data obtained between the Krummrich plant and Sauget Area 2. In this area, surficial groundwater samples contain lower contaminant concentrations than the deeper samples. These data show that the contamination found in deep groundwater beneath the Area 2 sites has a source other than the soils directly above. The presence of contamination in the deep groundwater samples indicates a plume extending west from the Krummrich plant to the Mississippi River. (Exhibit 11)

A geostatistical methodology called variography is used to determine the relationship, if any, between spatially distributed contaminants. (Exhibit 12) This spatial relationship can be graphically presented to show the extent of contaminant source influence in surrounding areas.

Variography performed on the DCP area chlorobenzene data illustrates an east-west plume of influence in the deep groundwater layer extending from the Krummrich plant to Site R. The variography also demonstrates that surface contaminant sources are distinct and isolated. (Exhibit 13) The contaminant commingling occurring at depth is shown in Figures 10 through 12.

The concentration gradient in deep groundwater from the Krummrich plant to the river indicates that there are multiple commingling sources originating from the Krummrich chlorobenzene facility and the associated disposal activities to the west and southwest of Krummrich. The data demonstrate that the groundwater contamination is primarily related to lateral groundwater flow from the vicinity of the Krummrich plant coupled with a significant vertical contribution from Site R. (Exhibit 11)

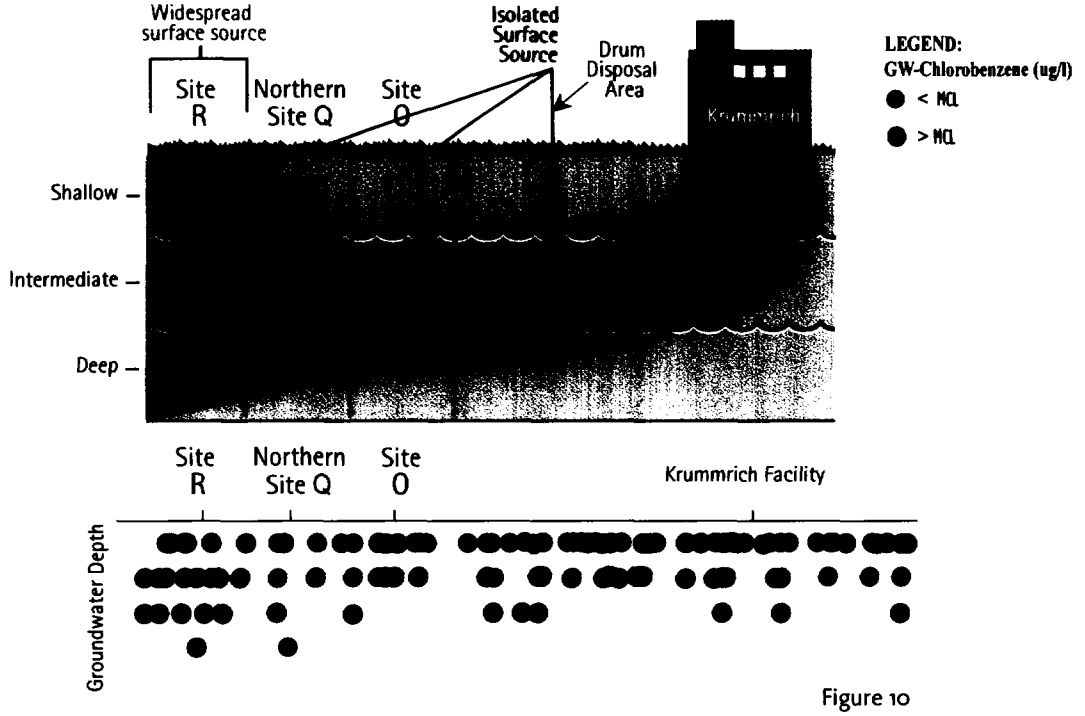


Figure 10

US EPA'S SITE CONCEPTUAL MODEL

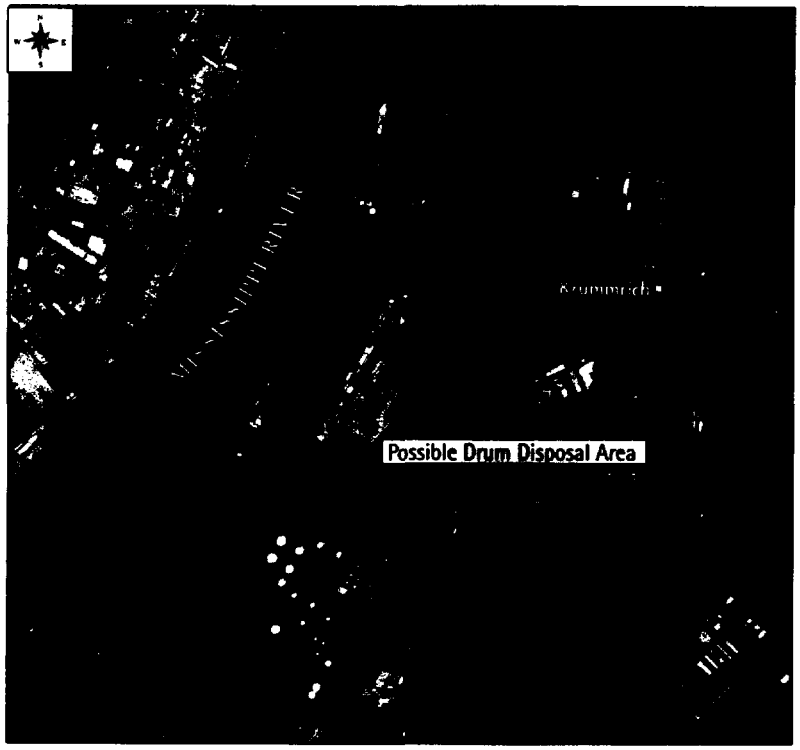


Figure 11

The US EPA's site conceptual model does not address the directional characteristics of the groundwater plume from the Krummrich plant towards the Mississippi River.

APPROPRIATE SITE CONCEPTUAL MODEL

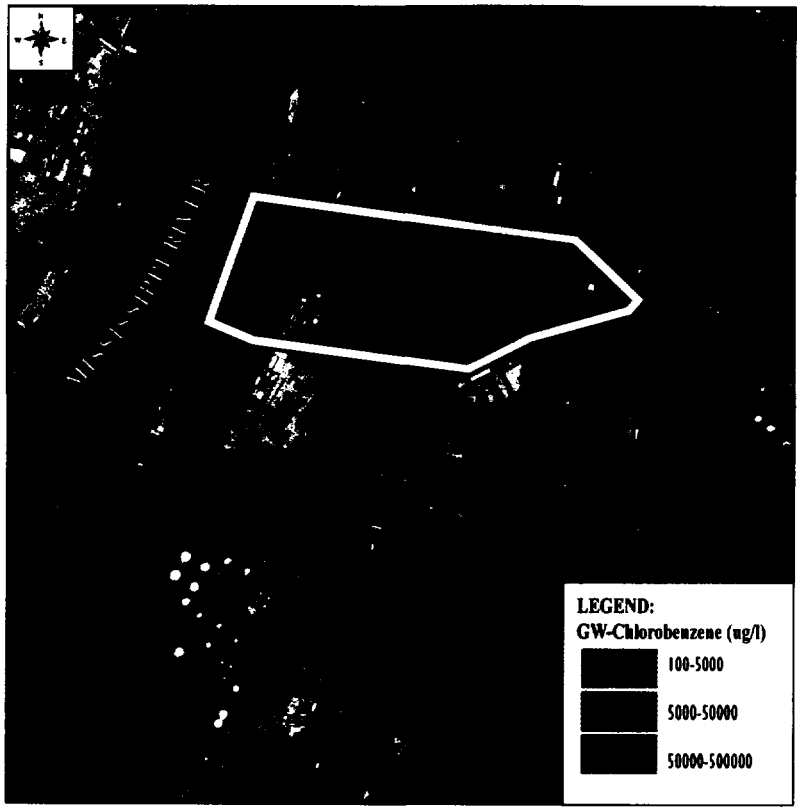


Figure 12

The appropriate site conceptual model addresses the directional flow of the groundwater contaminant plume.

The hydrogeology in the area also supports the conclusion that the US EPA CSM is not appropriate for either hazard ranking purposes or risk pathway management.

SURFACE WATER

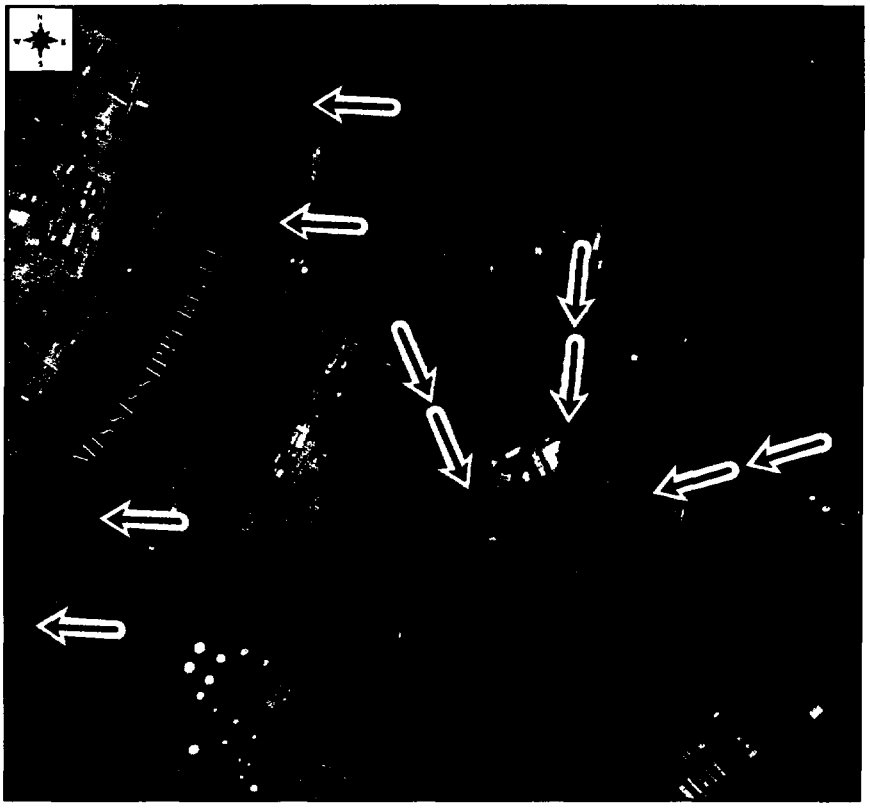


Figure 13

Surface water east of the levee generally flows towards Dead Creek and west of the levee it flows towards the river.

The US EPA grouping of sources and analysis of risk is based on the stated concern that the direct and/or indirect discharge of groundwater to the Mississippi River represents the primary environmental and human health risk. (Exhibit 1) However, the boundaries established by the US EPA in the source grouping are illogical from the standpoint of ultimate remediation requirements. The boundaries chosen for Area 2 would seem to eliminate from consideration the natural surface and groundwater flow pathways.

As noted in the US EPA's NPL listing document (Exhibit 1), an ACOE 500-year flood control levee prohibits surface water flow in a westward direction from areas east of the levee (Figure 13). The surface water runoff east of the levee within Area 2 is either directed to the east or toward depressions with no runoff potential. The latter occurs within Site P.

GROUNDWATER TO SURFACE WATER MIGRATION

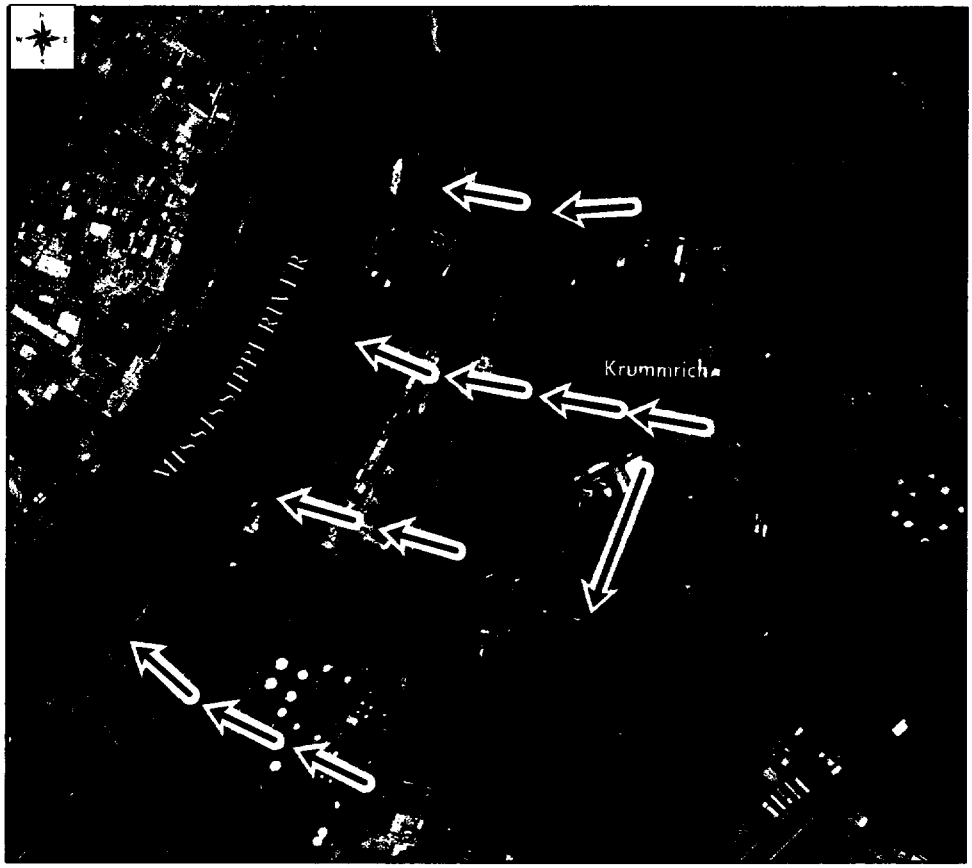


Figure 14

Groundwater flows to the west across the entire region toward the Mississippi River. This groundwater flow ensures that groundwater contamination at the Krummrich plant will flow beneath portions of Area 2, including Sites O, Northern Site Q and Site R, as it continues toward the Mississippi River. Because groundwater flows from east to west, groundwater contaminants discharged from the Krummrich plant and related facilities commingle in the groundwater in the direction of groundwater flow. However, because conditions in the Mississippi River are dominant in the groundwater flow regime, there is no groundwater gradient north or south. As a result, there is no commingling of groundwater contaminants from Site P, Central Site Q, or Southern Site Q with the primary groundwater plume beneath Site R. Dead Creek diverts groundwater to the south when the groundwater elevation intersects the creek invert. (Exhibit 9)

The pattern of surface and groundwater flow in the Sauget area divides the area into distinct spheres of influence inconsistent with the current US EPA's CSM. The NPL listing document recognized this physical constraint, "The levee, which splits this site from north to south, may act as an impedance to surface water flow, it does not stop contaminants in the ground water from flowing beneath it to surface water via seeps or direct communication between groundwater and the river." (Exhibit 1, page 34)

The aggregation of alleged sources into Area 2 is not justified by the analytical data. Sources in the Dead Creek Project area are related along an east-west axis. The primary source of risk to the Mississippi River is a groundwater contaminant plume that extends from the Krummrich plant to the Mississippi River.

SITE P SHOULD NOT BE AGGREGATED INTO AREA 2

Site P should not be aggregated with other Area 2 sites because the disposal practices (both waste material and method of disposal) were not the same as those at the other sites. Site P is geographically and hydrologically separate from the other sites. The groundwater contaminants associated with Site P are of significantly lower toxicity and environmental persistence and thus pose less potential risk to human health and the environment.

Site P has been inappropriately aggregated into Area 2 according to IEPA and US EPA HRS guidance criteria. IEPA originally used four criteria to group sites, and Site P fails all four of the criteria. IEPA acknowledged this fact in the 1988 Expanded Site Investigation. (Exhibit 3) US EPA uses six specific criteria to group sites for scoring purposes. (Exhibit 14) All criteria must be satisfied to group sites (sources) for HRS scoring. Site P does not satisfy at least five of the six US EPA criteria.

In general, both the IEPA and US EPA guidance identifies common exposure pathways, ownership, types of operation, waste types, and geographic relationships as the factors governing grouping of sites (or sources) into a single area for scoring a particular pathway. The factors demonstrating that Site P should not be aggregated into Area 2 are as follows:

1) There is definitive geographic separation between Site P and the other sites in the proposed Area 2.
2) The activities at Site P (landfilling only) were different from the activities at the other sites in Area 2.
3) There is no common exposure pathway between Site P and the other sites in Area 2. Neither surface water nor groundwater from Site P commingles with water from the remaining sites or sources within Area 2.
4) No plume of any significance has been identified as emanating from Site P and thus Site P is not a source. The only contaminants that could potentially have been released from Site P, phenol and manganese, are unrelated to the primary contaminants at the other Area 2 sites.

   The detection of phenol at 12 ppb in a single groundwater sampling point is three orders of magnitude below the US EPA Region 9 health-based screening level of 22,000 ppb. (Exhibit 15).

   The manganese is likely natural background material from soil pulled into the groundwater sample by turbid GeoProbe sampling. This latter conclusion is based on the fact that the soil manganese concentration in Site P (280 ppm at sample X107) is less than the soil manganese concentration in the US EPA background sample (331 ppm at sample X101). (Exhibit 1)

   Low levels of PCBs (0.087 ppb in well G110) were identified in the groundwater underlying the site. However, the concentrations of PCBs at Site P were below the concentrations in US EPA's background well (1.29 ppb in well G109). (Exhibit 1)
5) There is no new information or data that warrants modification of the 1988 IEPA decision to handle Site P as a peripheral site. The IEPA position was as follows:

   Site P "[does] not meet requirements for site aggregation and will be referred to henceforth as peripheral." (Exhibit 3, page 2-1)

The following figures provide additional support for the absence of an appropriate rationale for grouping Site P with the remainder of Area 2 sites and sources.

Geographic proximity

Site P is physically isolated from the other Area 2 sites.

Site P is surrounded by railroad embankments on either side and a ridge (Monsanto Avenue) along the southern border, essentially isolating the site from impact or contribution to the other Area 2 sites. (Figure 15) (Exhibit 2)

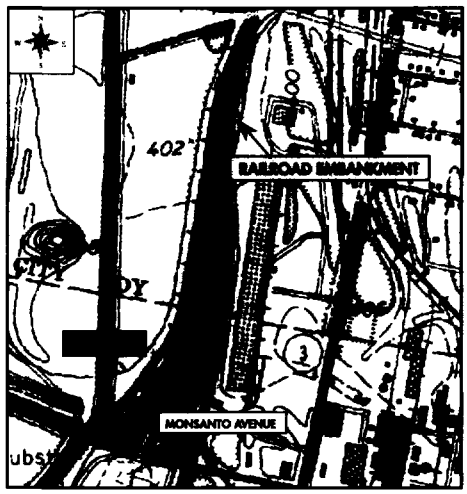


Figure 15

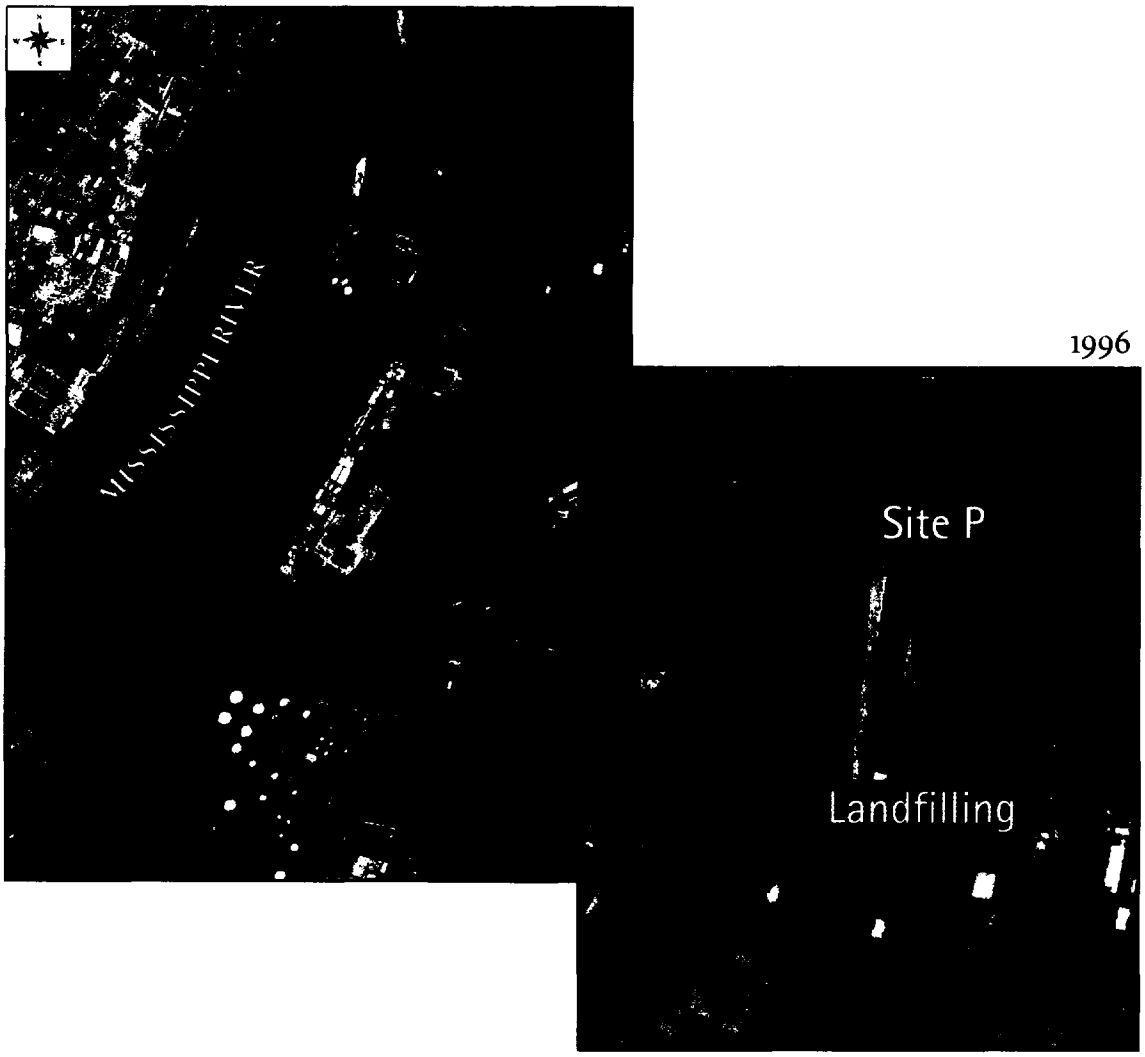


Figure 16

Source types/Waste types

US EPA has defined source types for determination of surface area or volume of disposed material as:

- Landfill
- Surface Impoundment
- Drums
- Tanks and Containers
- Contaminated Soil
- Piles

Site P is a small IEPA-permitted landfill that accepted primarily non-hazardous and non-chemical industrial solid waste. (Exhibit 1) Other sites in Area 2 include drum disposal areas, sludge ponds and unpermitted landfills (Figure 16). Although landfilling activities were performed, soil and groundwater data demonstrate that Site P is not a source area and the contaminants present in the identified groundwater plume in Area 2 are not attributable to Site P.

Exposure Pathways

Site P has different potential targets than the other sites within Area 2. Unlike Sites Q and R, which are subject to periodic flooding, Site P is located behind the ACOE 500-year flood control levee and is not subject to flooding by the Mississippi River. (Exhibit 1) During periods of heavy rainfall, water may pond on Site P. However, due to the presence of elevated railroads and roadways surrounding the site, the surface water does not leave the site by overland flow (Figures 17 and 18). (Exhibit 2) The only areas potentially impacted by the presence of surface water are the onsite wetlands defined as temporarily, seasonally or semi-permanently flooded wetlands (Figure 19). (Exhibit 16) These very definitions are based on the presence of ponded surface water during periods of high precipitation (Figure 20).

Surface Water

Surface water does not discharge from Site P to the Mississippi River, but remains onsite. (Exhibit 2)

"Surface drainage will not leave the site due to the presence of railroad embankments along the perimeter and the depression in the central portion of the site. Surface drainage is to the south-central portion of the site, which was not landfilled due to the presence of a potable water line in this area." (Exhibit 2, page 12)

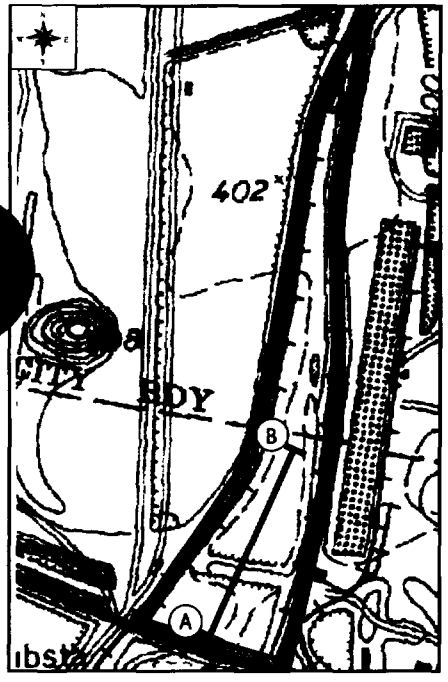


Figure 17

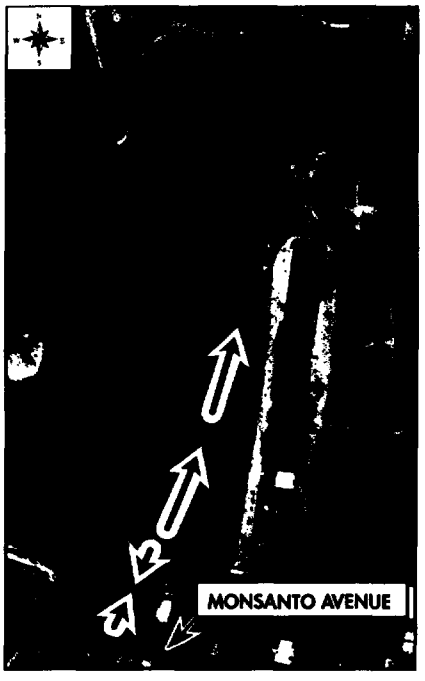
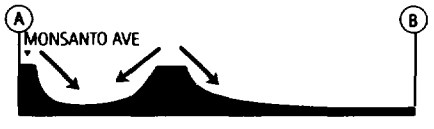


Figure 18

Figure 19



The low areas of Site P are defined on the United States Geological Survey (USGS) map as brown lines with small "teeth" indicating the downward slope. (Exhibit 17) The cross-section AB illustrates the surface water flow direction based on ground surface elevation.

The arrows depict the surface water flow direction within Site P. The areas of lower elevation and the direction of surface water flow are consistent with the wetland areas identified via aerial photography in the National Wetlands Inventory. (Exhibit 16)

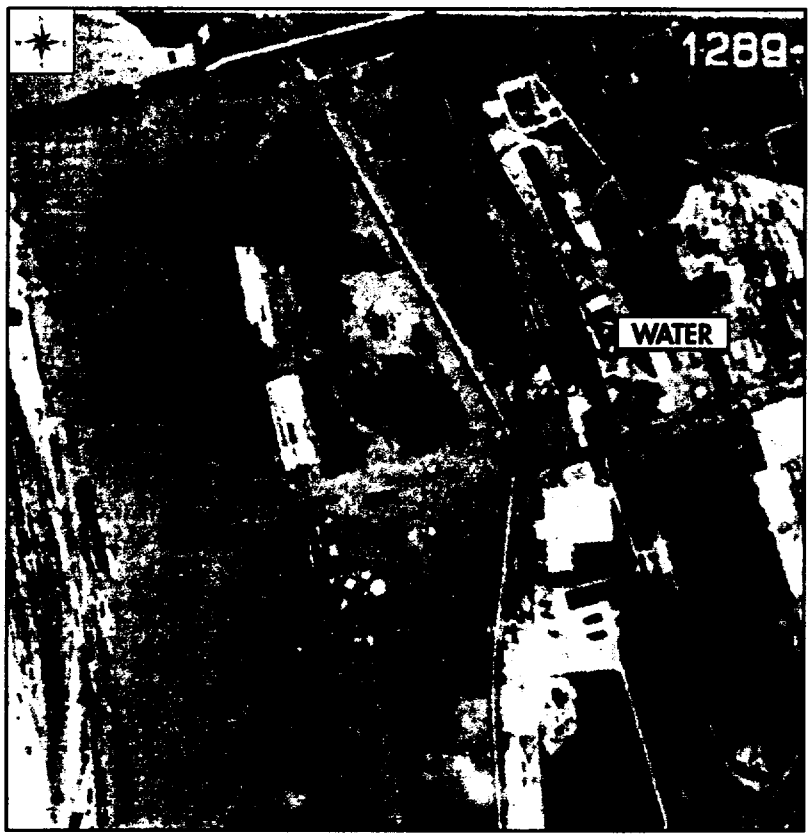


Figure 20

Even during the flood event of 1993, which was one of the largest floods in decades, Site P was not inundated by the Mississippi River. The ponding in the immediate area around Site P was a consequence of more than 14 inches of rainfall occurring over the prior two-month period (Exhibit 18) and the lack of drainage from the area, and is not indicative of flooding across the levee. The absence of drainage from Site P is evident in the aerial photograph taken during the 1993 flood. (Exhibit 19) Extensive ponding is obvious within Site P although the levee has not been overtopped.

The ponded water visible in Site P could not be a result of levee underflow because of the extended travel time from the river side of the levee to Site P during periods of reversed groundwater flow (Mississippi River flood conditions). Normal westward non-flood condition groundwater flow would resume before Site P would be impacted by the reverse flow. (Exhibit 20)

"A 500-year flood control levee protects Site P from direct Mississippi River flood events." (Exhibit 5, page 2)

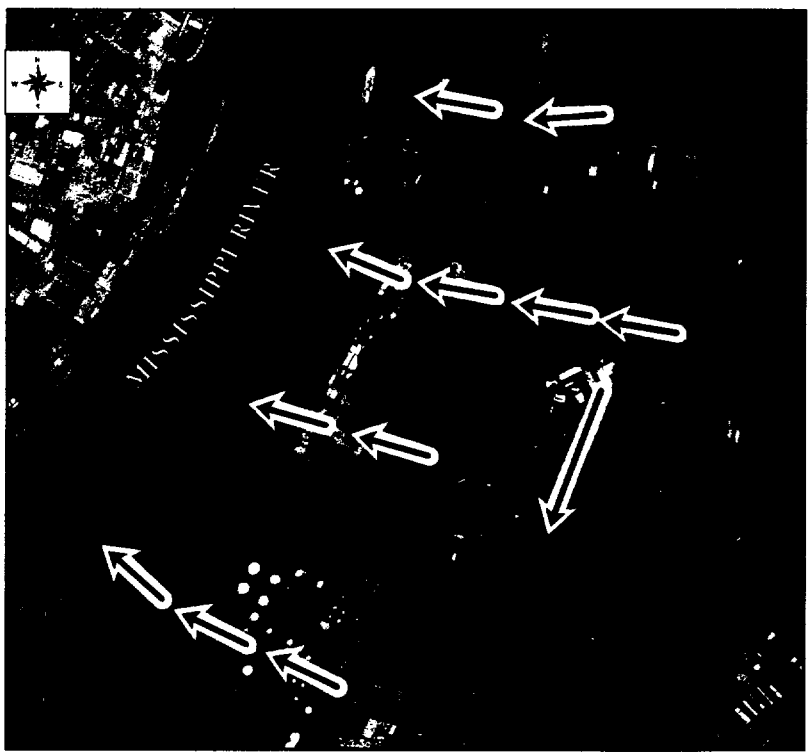


Figure 21

Groundwater

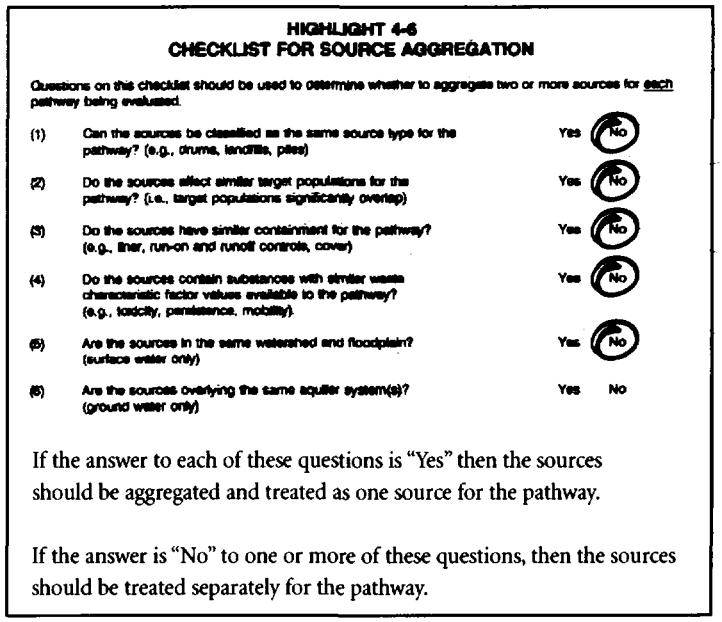
Groundwater from all of the sites in Area 2 discharges toward the Mississippi River (Figure 21). (Exhibit 1) However, because Site P is significantly north of the other Area 2 sites, groundwater discharging from Site P does not commingle with groundwater from the other sites. There is no commingling of the contaminant plume before or after discharge into the Mississippi River because no plume from Site P has been identified.

LEGEND:
GW-Chlorobenzene (ug/l)

- < MCL
- > MCL
- Dead Creek
- Groundwater Flow
- Area 2 Site
- Area 1 Site

According to the guidance criteria established by US EPA in the Hazard Ranking System Guidance Manual (HRSGM), Site P should not have been aggregated with the other Area 2 sites.

Figure 22 is the source aggregation HRSGM guidance checklist. (Exhibit 14) A summary of the response to each of the six questions is provided on the facing page



HIGHLIGHT 4-6
CHECKLIST FOR SOURCE AGGREGATION

Questions on this checklist should be used to determine whether to aggregate two or more sources for each pathway being evaluated.

(1)	Can the sources be classified as the same source type for the pathway? (e.g., drums, landfills, piles)	Yes	No
(2)	Do the sources affect similar target populations for the pathway? (i.e., target populations significantly overlap)	Yes	No
(3)	Do the sources have similar containment for the pathway? (e.g., liner, run-on and runoff controls, cover)	Yes	No
(4)	Do the sources contain substances with similar waste characteristic factor values available to the pathway? (e.g., toxicity, persistence, mobility)	Yes	No
(5)	Are the sources in the same watershed and floodplain? (surface water only)	Yes	No
(6)	Are the sources overlying the same aquifer system(s)? (ground water only)	Yes	No

If the answer to each of these questions is "Yes" then the sources should be aggregated and treated as one source for the pathway.

If the answer is "No" to one or more of these questions, then the sources should be treated separately for the pathway.

Figure 22

Site P should not be aggregated with other Area 2 sites because the disposal practices (both waste material and method of disposal) were not the same as those at the other sites. Site P is geographically and hydrologically separate from the other sites, which prevents the commingling of groundwater and runon/runoff of surface water from other sites. The groundwater contaminants associated with Site P are of significantly lower toxicity and environmental persistence and thus pose less potential risk to human health and the environment. Site P should be scored independent of the other Area 2 sites.

---

1. Can sources be classified as the same source type?

Other Area 2 sites were used for drum disposal, sludge lagoons and hazardous waste disposal. Site P was used principally for the disposal of non-hazardous waste. There are significant differences in soil and groundwater contaminants and concentrations at Site P and the other Area 2 sites. Site P contaminants are limited to phenol, manganese and PCB. The phenol concentration is orders of magnitude below any level of concern and the other two constituents are below levels found at US EPA Sauget Area 2 background locations. Site P is not a contaminant source.

2. Do the sources affect similar target populations for the pathway?

Surface water flows into wetland areas on Site P and does not flow towards the Mississippi River. Groundwater from Site P does not commingle with that of other Area 2 (or Area 1) sites. There is no identified groundwater plume migrating from Site P toward the Mississippi River and thus Site P is not a source...

3. Does the site have similar containment?

Site P is the only site in Area 2 that possesses hydrologic containment due to the absence of surface runon/runoff pathways from other areas. Site P is surrounded by railroad embankments on either side and a ridge (Monsanto Avenue) along the southern border, essentially isolating the site from impact or contribution to the other Area 2 sites.

4. Does the site have similar waste characteristics

The primary contaminants that affect the risk pathways for Area 2 are not present at Site P above background concentrations. The mobility, persistence, bioaccumulation and toxicity of contaminants present at Site P are significantly different than those present at other Area 2 sites.

5. Are the sites located on the same watershed and floodplain?

As noted above, Site P is not truly a source. Site P is located behind the ACOE 500-year flood control levee, and thus is not in the floodplain east of the levee where Sites Q and R are located. Site P is within the same watershed and floodplain as the Area 2 sites located on the west side of the levee.

6. Are the sources overlying the same aquifer system?

As discussed above, there is no contamination source at Site P. The aquifer system is, however, continuous at both Areas 1 and 2. Groundwater beneath Site P does not commingle with groundwater from other Area 2 sites or with Area 1 sites due to Site P's location north of the identified east-west groundwater contaminant plume.

SITE P DOES NOT QUALIFY FOR THE NPL

The US EPA determined that the use of groundwater as a drinking water source in the vicinity of Sauget Areas 1 and 2 was not likely due to the availability of municipal water. (Exhibit 1) Based on this determination, the drinking water pathway was not scored by US EPA during the Area 2 HRS site scoring process; scoring of Area 2 was based on the surface water overland/flood migration pathway and the groundwater to surface water migration pathway.

As noted above, US EPA's own policy does not support Site P's aggregation with the other Area 2 sites for calculating an HRS site score for NPL listing consideration. When Site P is considered as an independent site, it clearly presents no risk to human health and the environment. The following tables display the US EPA procedure used to calculate the HRS site score for the entirety of Area 2 and the more detailed worksheets for calculating the surface water overland/flood migration and groundwater to surface water migration components of site risk. (Exhibit 21) The scoring of Site P, as an independent entity, and the resulting total scores are presented in the right-hand column within each table.

TABLE 4-1
SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET

Factor Categories and Factors	Maximum Value
HUMAN FOOD CHAIN THREAT	
Likelihood of Release	
14. Likelihood of Release (same value as line 5)	550
Waste Characteristics	
15. Toxicity/Persistence/Bioaccumulation	a
16. Hazardous Waste Quantity	a
17. Waste Characteristics	1,000
Targets	
18. Food Chain Individual	50
19. Population	
19a. Level I Concentrations	b
19b. Level II Concentrations	b
19c. Potential Human Food Chain Contamination	b
19d. Population (lines 19a + 19b + 19c)	b
20. Targets (lines 18 + 19d)	b
Human Food Chain Threat Score	
21. Human Food Chain Threat Score ([lines 14 x 17 x 20]/82,500, subject to a maximum of 100)	100
ENVIRONMENTAL THREAT	
Likelihood of Release	
22. Likelihood of Release (same value as line 5)	550
Waste Characteristics	
23. Ecosystem Toxicity/Persistence/Bioaccumulation	a
24. Hazardous Waste Quantity	a
25. Waste Characteristics	1,000
Targets	
26. Sensitive Environments	
26a. Level I Concentrations	b
26b. Level II Concentrations	b
26c. Potential Contamination	b
26d. Sensitive Environments (lines 26a + 26b + 26c)	b
27. Targets (value from 26d)	b
Environmental Threat Score	
28. Environmental Threat Score ([lines 22 x 25 x 27]/82,500, subject to a maximum of 60)	60
SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORE FOR A WATERSHED	
29. Watershed Score[c] (lines 13 + 21 + 28, subject to a maximum of 100)	100
SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORE	
30. Component Score (S_{sw})[c], (highest score from line 29 for all watersheds evaluated, subject to a maximum of 100)	100

[a]Maximum value applies to waste characteristics category. [b]Maximum value not applicable. [c]Do not round to nearest integer.

Figure 23

Likelihood of Release:

The potential to release is based on the potential for overland flow to impact surface water, and the potential for flooding which would impact surface water bodies. The values for the two release potentials are added to obtain the assigned value. (Exhibit 22)

The US EPA Area 2 assigned value is based on the potential for surface water to flow across Sites Q and R and into the Mississippi River and on the potential of these two sites to flood during Mississippi River flood events. US EPA assigned the maximum value of 550 because drums were exposed at Sites Q and R following two flood events, which is sufficient evidence of an observed release to surface water. In addition, these two sites typically experience annual flooding. (Exhibit 1)

The Site P likelihood of release value is 100 based on total site area less than 50 acres, and the maximum (worst case) assumptions for soil type and rainfall. The potential for flooding is zero based on the presence of the ACOE 500-year flood control levee and the US EPA conclusion that runoff does not leave Site P. (Exhibit 1)

Target/Food Chain:

The potential overland flow/flood migration pathway from Site P does not impact a fishery (there is no overland flow from the site to the Mississippi River). However, since a potential fishery is located within 15 miles downgradient of Site P (Exhibit 2), the surface water dilution (Exhibit 27) was determined and an assigned value of 1.0 was used to assess the food chain individual. (Exhibit 28) US EPA assigned a value of 45 based on the detection of contaminants at concentrations below screening levels and the presence of a fishery. (Exhibit 28)

Target/Environmental:

The US EPA determined that for the entirety of Area 2, six endangered species were potentially impacted. Site P, as an independent site, potentially impacts only the Common Moorhen (Exhibit 29) (assigned value of 50) (Exhibit 30) and the perimeter of the wetland areas is less than one mile (assigned value of 25) (Exhibit 31) resulting in a total sensitive environment assigned value of 75. (Exhibit 30) US EPA assigned a sensitive environment value of 425 based on six endangered species (325) and a total length of wetland between three and four miles (assigned value of 100).

Waste Characteristics:

The toxicity/persistence/bioaccumulation factor is significantly less for Site P (assigned value of 5) (Exhibit 23, 24, 25, 26) due to the characteristics of the identified contaminants (phenol and manganese) as compared to those of the Area 2 contaminants (PCBs and pesticides) (assigned value of 500,000,000). Low concentrations of PCBs were detected in groundwater at Site P; these concentrations were less than the background concentrations and thus are not considered attributable to the site. The following specific values illustrate the difference:

Factors	Site P	Area 2
Toxicity		
Persistence		
Bioaccumulation		

TABLE 4-25
GROUND WATER TO SURFACE WATER MIGRATION PATHWAY SCORESHEET

Factor Categories and Factors	Maximum Value
HUMAN FOOD CHAIN THREAT	
Likelihood of Release	
12. Likelihood of Release (same value as line 3)	550
Waste Characteristics	
13. Toxicity/Mobility/Persistence/Bioaccumulation	(a)
14. Hazardous Waste Quantity	(a)
15. Waste Characteristics	1,000
Targets	
16. Food Chain Individual	50
17. Population	
17a. Level I Concentrations	(b)
17b. Level II Concentrations	(b)
17c. Potential Human Food Chain Contamination	(b)
17d. Population (lines 17a + 17b + 17c)	(b)
18. Targets (lines 16 + 17d)	(b)
Human Food Chain Threat Score	
19. Human Food Chain Threat Score ([lines 12 x 15 x 18] / 82,500, subject to a maximum of 100)	100
ENVIRONMENTAL THREAT	
Likelihood of Release	
20. Likelihood of Release (same value as line 3)	550
Waste Characteristics	
21. Ecosystem Toxicity/Mobility/Persistence/Bioaccumulation	(a)
22. Hazardous Waste Quantity	(a)
23. Waste Characteristics	1,000
Targets	
24. Sensitive Environments:	
24a. Level I Concentrations	(b)
24b. Level II Concentrations	(b)
24c. Potential Contamination	(b)
24d. Sensitive Environments (lines 24a + 24b + 24c)	(b)
25. Targets (value from line 24d)	(b)
Environmental Threat Score	
26. Environmental Threat Score ([lines 20 x 23 x 25]/ 82,500, subject to a maximum of 60)	60
GROUNDWATER TO SURFACE WATER MIGRATION COMPONENT SCORE FOR A WATERSHED	
27. Watershed Score[c] (lines 11 + 19 + 26, subject to a maximum of 100)	100
28. Component Score (S_{gw})[c] (highest score from line 27 for all watersheds evaluated, subject to a maximum of 100)	100

Figure 24

Likelihood of Release:

There is no observed release of contaminants attributable to Site P and thus the scoring is based on the potential to release. (Exhibit 32) The potential to release considers containment (Exhibit 33) net precipitation (Exhibit 34), depth to the aquifer (Exhibit 35), and travel time of groundwater to surface water. (Exhibit 36) The maximum values (worst case scenario) were assigned with the exception of the net precipitation value. The net precipitation value was determined by the monthly precipitation and evaporatranspiration based on geographic location. (Exhibit 34) US EPA assigned a maximum value of 550 based on an observed release to surface water (exposed drums at Sites Q and R following Mississippi River flood event) (Exhibit 1). A value of 430 was assigned for Site P, based on the potential to release and the site characteristics. (Exhibit 37)

Target/Environmental:

The US EPA determined that for the entirety of Area 2, six endangered species were potentially impacted. (Exhibit 1) Site P, as an independent site, potentially impacts only the Common Moorhen (Exhibit 29) (assigned value of 50) (Exhibit 30) and the perimeter of the wetland areas is less than one mile (assigned value of 25) (Exhibit 31) resulting in a total sensitive environment assigned value of 75. (Exhibit 30) US EPA assigned a sensitive environment value of 425 based on six endangered species (325) and a total length of wetland between three and four miles (assigned value of 100).

Target/Food Chain:

The food chain individual value for Site P, even when considering the presence of a fishery in the Mississippi River, is significantly less than that when evaluating the entirety of Area 2 because the contaminants in Site P groundwater do not present a risk of bioaccumulation in organisms. (Exhibit 38) However, since a potential fishery is located within 15 miles downgradient of Site P, the surface water dilution (Exhibit 27) was determined and an assigned value of 1.0 was used to assess the food chain individual. (Exhibit 28) US EPA assigned a value of 45 based on the detection of contaminants at concentrations below screening levels and the presence of a fishery. (Exhibit 1)

Waste Characteristics:

The toxicity/persistence/bioaccumulation factor is significantly less for Site P (assigned value of 5) (Exhibit 23, 24, 25, 26) due to the characteristics of the identified contaminants (phenol and manganese) as compared to those of the Area 2 contaminants (PCBs and pesticides) (assigned value of 500,000,000) (Exhibit 26). Low concentrations of PCBs were detected in groundwater at Site P; these concentrations were less than the background concentrations and thus are not considered attributable to the site. The following specific values illustrate the difference:

Factors	Site P	Area 2
Toxicity		
Persistence		
Bioaccumulation		

WORKSHEET FOR COMPUTING HRS SITE SCORE

1.	Ground Water Migration Pathway Score (S_{gw}) (from Table 3-1, line 13)		
2a.	Surface Water Overland/Flood Migration Component (from Table 4-1, line 30)		
2b.	Ground Water to Surface Water Migration Component (from Table 4-25, line 28)		
2c.	Surface Water Migration Pathway Score (S_{sw}) Enter the larger of lines 2a and 2b as the pathway score.		
3.	Soil Exposure Pathway Score (S_s) (from Table 5-1, line 22)		
4.	Air Migration Pathway Score (S_a) (from Table 6-1, line 12)		
5.	Total of $S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2$		
6.	HRS Site Score Divide the value on line 5 by 4 and take the square root	50.00	0.6

Figure 25

- There has been no observed contaminant release at Site P. The levee between Site P and the Mississippi River minimizes the likelihood of any release.
- Manganese and phenol are the only contaminants found in the groundwater at Site P. These two pollutants represent only a minimal risk to human health or the environment.
- Site P has not been documented to provide a habitat for bald eagles, herons, or egrets. The only endangered species seen in the region is the common moorhen

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The HRS score of Site P, independent of the other Area 2 sites, is well below the threshold value for NPL listing of 28.5. (Exhibit 10) The difference in the HRS score is primarily due to the characteristics of the groundwater contaminants associated with Site P and the small area of potential surface water impact (wetlands within Site P).

Site P, when evaluated separately, does not qualify for National Priorities List consideration.

SITE Q HAS NOT BEEN CONSISTENTLY OR ADEQUATELY DEFINED

The boundaries of Site Q as defined in the NPL listing document do not correlate with available data and earlier US EPA or IEPA designations. As a result, the boundaries are not based on fact but instead arbitrary dimensions governed by site features (i.e. roads, riverbank) that are not related to waste disposal practices. These five photographs demonstrate how the definition of Site Q has changed over time.

1962

Figure 26

Location of ash lagoons identified by AERODATA. (Exhibit 7)

MAY 1988

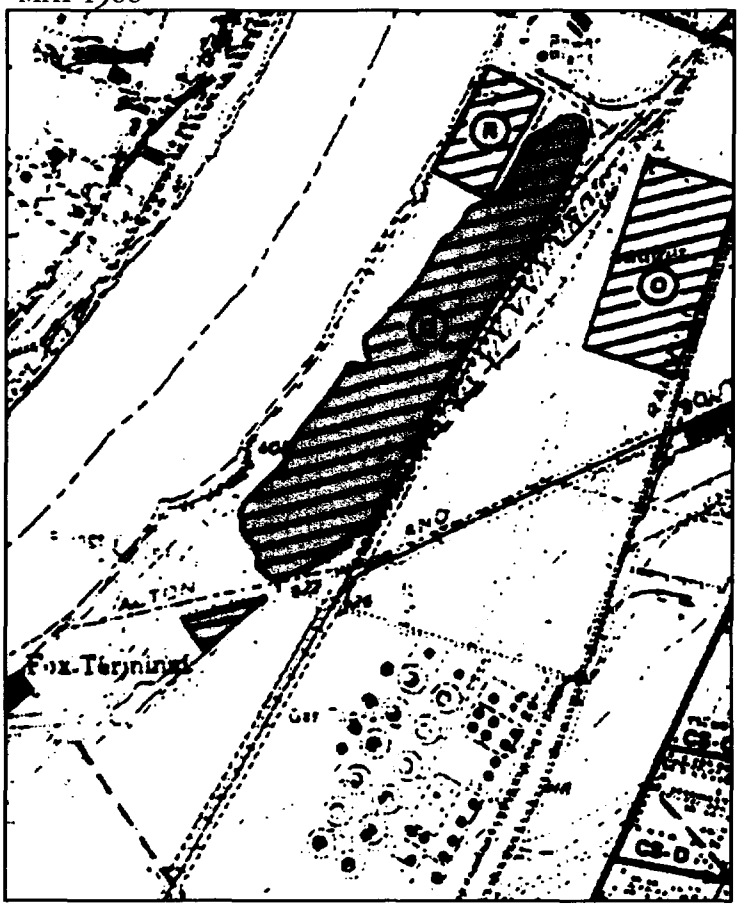


Figure 27

"The site is approximately 90 acres in size, including a southern extension as delineated by the Alton and Southern Railroad tracks."

---Ecology and the Environment, Inc. Expanded Site Investigation Dead Creek Project Sites at Cahokia/Sauget, Illinois, Volume 1 of 2. May 1988. (Exhibit 3)

MARCH 2000

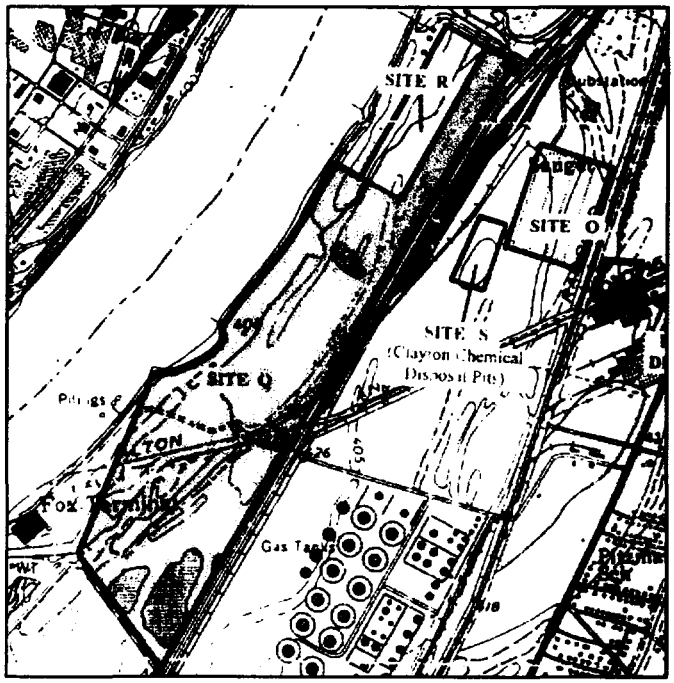


Figure 28

"The individual site acreage is as follows:...Site Q (225.1 acres)"

---Ecology and the Environment (CH2M Hill). Soil Sample Results for Chemical Contamination below Sauget/Sauget Landfill in Sauget, Illinois. December 16, 1983. (Exhibit 5)

JULY 2000

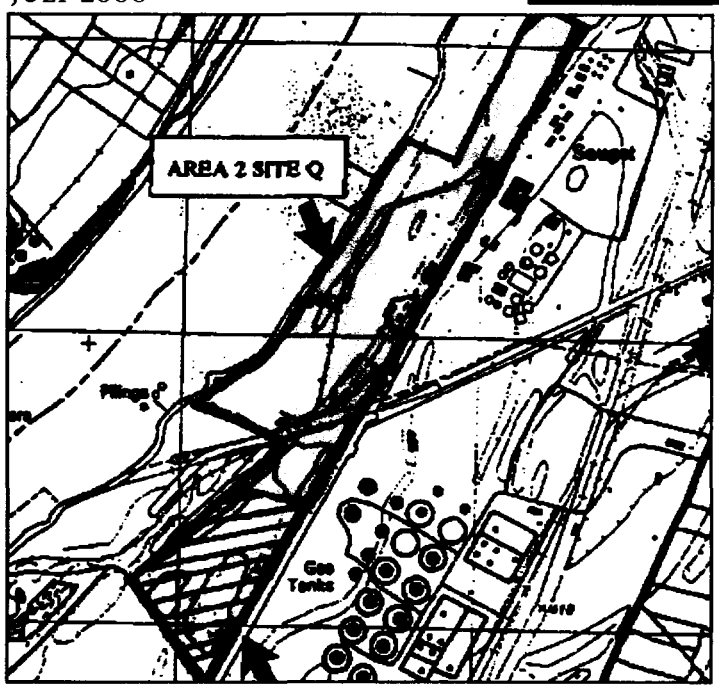


Figure 29

No definitive statement on acreage of Site Q (references 90 acres and the 25 acres of contamination addressed in removal action)

---Ecology and the Environment, Inc. Draft of Federal On-scene Coordinator's Report for Area 2 Site Q, Cahokia, St. Clair County, Illinois. July 31, 2000. (Exhibit 42)

MARCH 2001

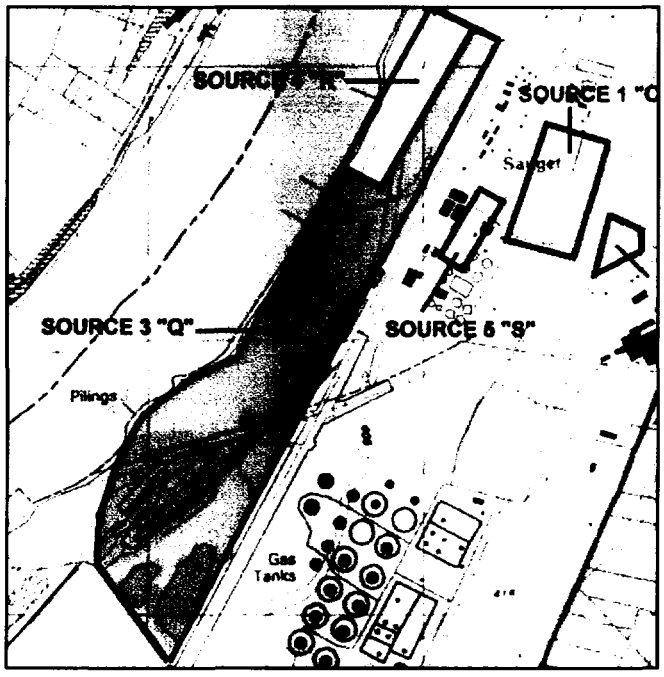


Figure 30

"Source Q is an inactive waste landfill in Sauget, Illinois that covers approximately 225 acres."

---US Environmental Protection Agency (US EPA). **Hazard Ranking** System Listing Document, Sauget Area 2, 2001(Exhibit 5)

THE ASH PONDS IN CENTRAL SITE Q SHOULD NOT BE AGGEGRATED WITH NORTHERN AND SOUTHERN SITE Q.

A small portion of Central Site Q was used for disposal of combustion-related materials (ash). There is no evidence of disposal operations similar to those conducted in Northern and/or Southern Site Q having occurred in the ash pond area within Central Site Q.

The Hazard Ranking System Guidance Manual (HRSGM) provides criteria for designating overlapping sources as a single source. (Exhibit 14) **The following conditions are necessary to aggregate such sources:**

- **Same source type (landfill, surface impoundment, pile, etc.)**
- **Similar characteristics (E.G., proximity of units, hazardous substances associated with the units)**

The three distinct areas in Site Q do not satisfy these criteria and should not be aggregated into a single source.

There is no evidence that there is similarity in operational history throughout Site Q. As shown in Figure 31, the Sauget Municipal landfill was defined as the portion of Site Q immediately east of Site R in a CH2M Hill report in 1983. (Exhibit 6)The referenced report describes the Sauget/Sauget Landfill as a municipal landfill directly adjacent to the Krummrich Sauget/Toxic Landfill. The toxic landfill shown in Figure 31 is the area now described as Site R.

Site Q is not, as suggested by US EPA, a 225 acre landfill operated by Sauget and Company. In conjunction with its operation in Site R, Sauget and Company operated a landfill in the dogleg section of Northern Site Q. In addition, Sauget and Company operated a landfill in Southern Site Q near the Alton and Southern Railroad lines. Unrelated and separate from those activities, Union Electric operated ash ponds in a small, 32 acre portion of Central Site Q. (Exhibit 2) There is simply no evidence of similarity in operational history throughout Site Q.

The descriptions of the landfilling activities and the geophysical and intrusive sampling data all demonstrate that the Sauget/Sauget Landfill is limited to the area immediately east of Site R. A geophysical survey described in a 1983 report identified the probable limits of landfilling and burial zones of relatively large concentrations of iron-bearing material such as drums or car bodies. (Exhibit 6) Following the geophysical investigation, a drilling sampling program was conducted to determine if subsurface soils were contaminated. The extent of the sampling program is shown on Figure 32. As shown in Figure 32, the sampling program, which was designed to define the landfill footprint, was conducted only in the same small area east of Site R.

There is no evidence that there was a continuous, similar disposal operation between the northern and southern areas of landfilling in Site Q. The southern area was a definite target area for drum disposal as there were large borrow pits available for disposal. These pits were created when the ACOE levee was constructed. (Exhibit 2) By contrast the central portion of Site Q contained ash impoundments. In addition, random dumping of household-type waste was reported in this area. (Exhibit 3)

The data further demonstrate that the contaminant conditions in the three portions of Site Q are unrelated. The following pages provide additional support for the necessity of considering Site Q as three distinct sources.

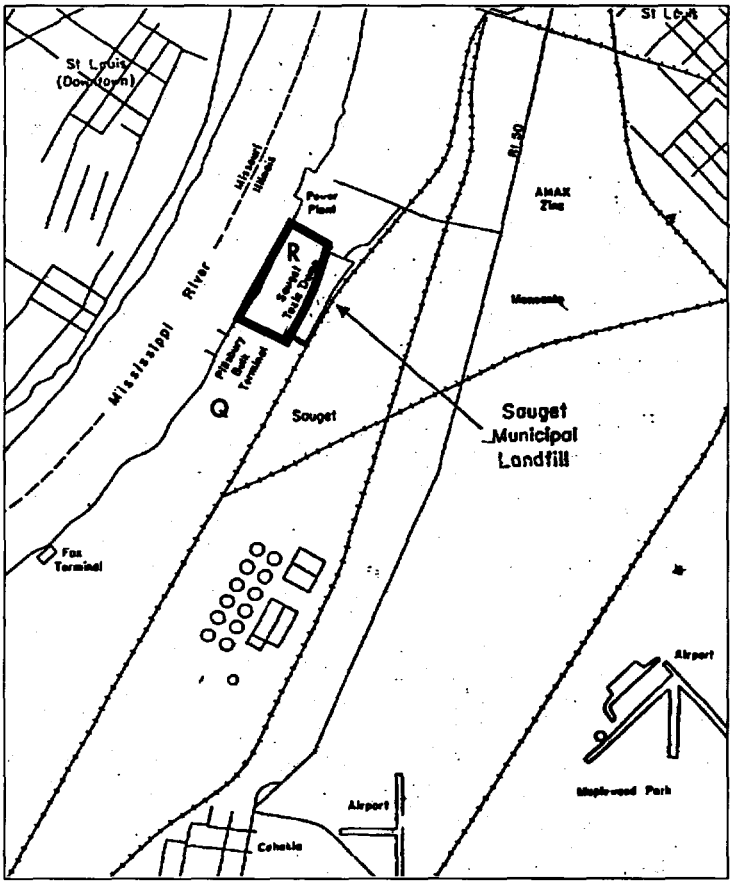


Figure 31

Only green lines are added.

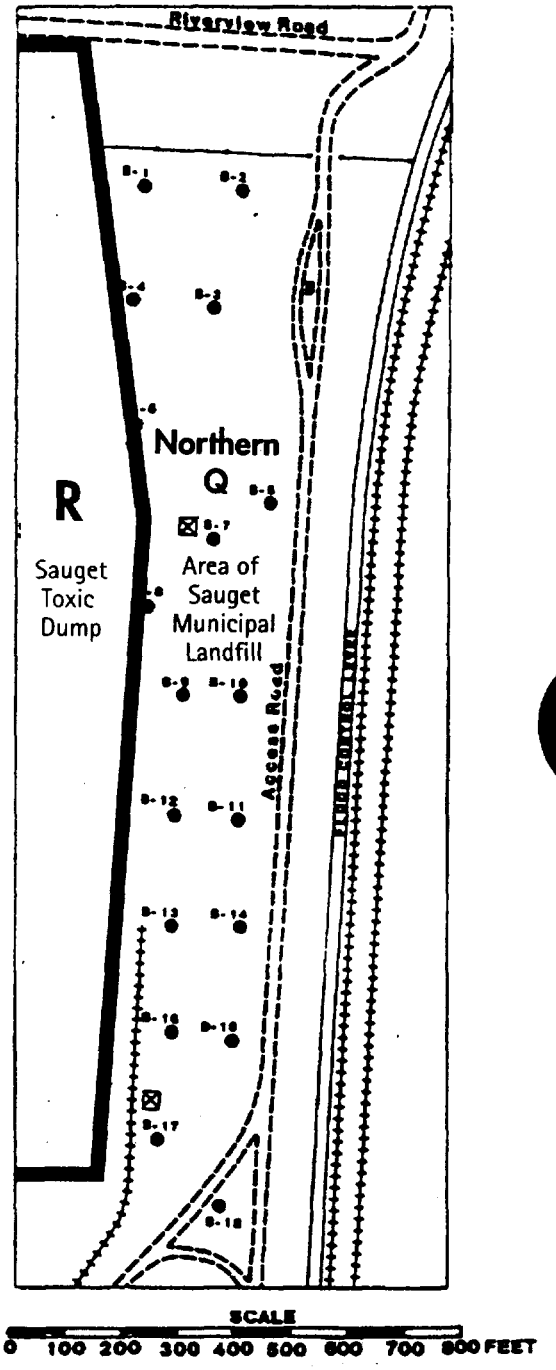


Figure 32

1. Site-specific disposal areas

Various borrow pits in the southern part of Site Q were utilized for direct drum burial during the 1960s and 70s. (Exhibit 2)

In contrast, a small section of Northern Site Q was used by Sauget and Company as a municipal landfill. (Exhibit 3) The central portion was used only for ash disposal. (Exhibit 2)

1962

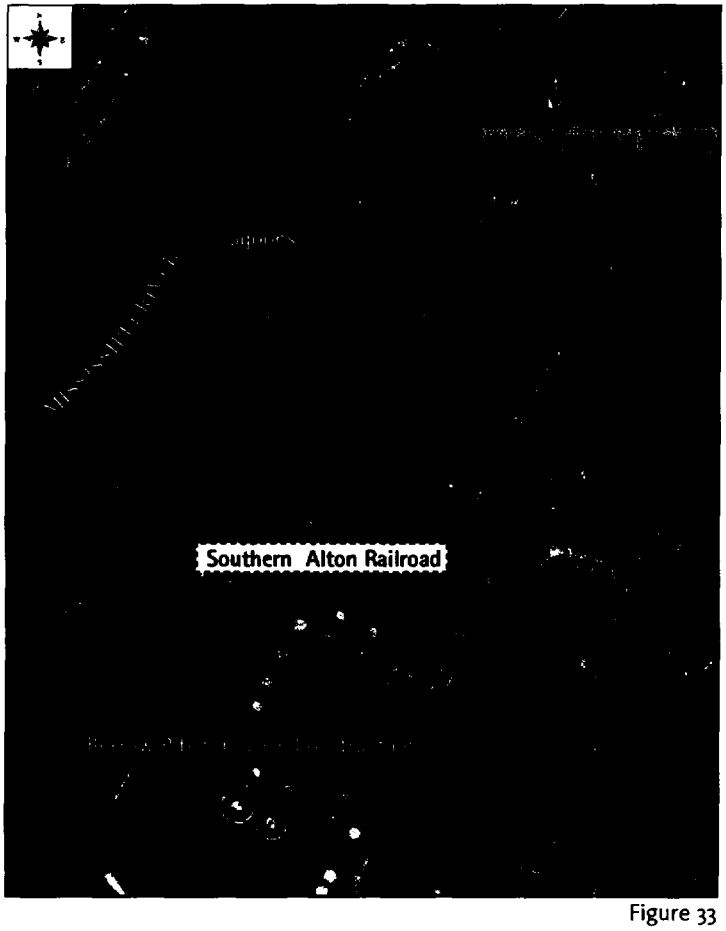
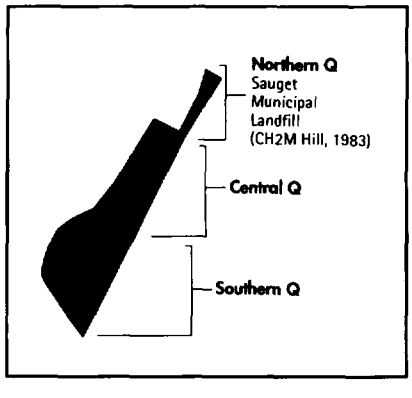


Figure 33

1971

Figure 34



2. Hazardous substances found in the overlapping sources

Average Groundwater Concentrations in Referenced Area (ug/l)

Average PCB Concentrations	0.015	0	0.37	84	[illegible]
Average Nitrobenzene Concentrations	286	2,892	0	0	[illegible]
Average Chloroaniline Concentrations	31,872	9475	102	0	[illegible]

Figure 35

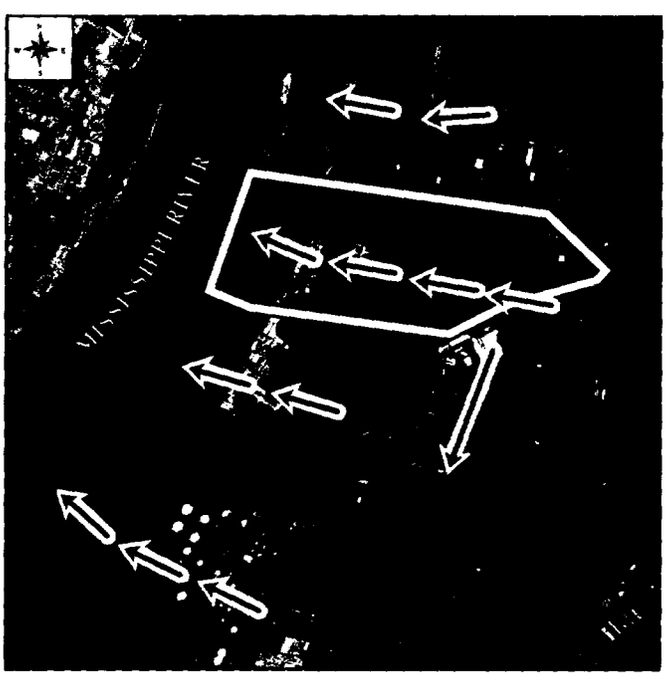


Figure 36

LEGEND:
GW-Chlorobenzene (ug/l)

- < MCL
- > MCL
- Dead Creek
- Appropriate Groundwater Plume Conceptual Model
- Groundwater flow

The groundwater quality under Northern Site Q is affected by the plume that extends east to west from the vicinity of the Krummrich facility to the Mississippi River. This includes impacts from Site R. Between 1957 and 1977, Site R was used to dispose of liquid and solid industrial waste, including solvents, pesticides and heavy metals. (Exhibit 3)Liquid chemical wastes were pumped from tank trucks and drums into several hazardous waste ponds. (Exhibit 2) The contaminant characteristics of Northern Q are indistinguishable from those of Site R and the surrounding groundwater plume. However, Northern and Southern Q show very different contaminant characteristics.

Figures 35 and 36 demonstrate the distinct difference between Northern Site Q and Central and Southern Site Q. Figure 35 presents the average groundwater concentration of three indicator parameters—PCBs, nitrobenzene, and chloroaniline—within five different areas. (Exhibit 9) Figure 36 provides a post plot of the chlorobenzene data throughout the subject area. (Exhibit 11)

As shown in Figure 31, groundwater under Northern Site Q contains high levels of chloroaniline. The concentrations are the same order of magnitude as those found within the east-west plume and beneath Site R. By contrast, the chlorobenzene concentrations within Southern and Central Site Q are two orders of magnitude lower. A similar discrepancy exists between Northern Site Q and Southern and Central Site Q with respect to nitrobenzene. Northern Site Q groundwater contains an average nitrobenzene concentration of 2,892 µg/l, whereas there is no nitrobenzene in the Southern and Central portions of Site Q. (Exhibit 9)

The groundwater pattern is reversed with the PCB compounds. PCBs are present in the groundwater in Central and Southern Site Q (primarily Southern Site Q except for one detection in Central Site Q), whereas there are no detectable PCBs in Northern Site Q groundwater. Likewise, there are only very low detections throughout the east-west plume that passes beneath Northern Site Q. (Exhibit 9)

The same pattern of distinctive difference between Northern Site Q and the central and southern portions of Site Q is demonstrated clearly by the groundwater chlorobenzene data. As shown in Figure 36, the chlorobenzene data demonstrates that a groundwater plume extending from east to west under Northern Site Q and Site R is not commingling with groundwater under Central and Southern Site Q. (Exhibit 11) The chlorobenzene is a mobile contaminant that provides a tracer function for indicating groundwater flow direction. (Exhibit 39) There is virtually no chlorobenzene south of the Site R southern boundary. The absence of this contaminant, coupled with the groundwater elevation data, demonstrates conclusively that groundwater issues between Northern Site Q the central and southern portions of Site Q should not be considered together.

A small portion of Central Site Q was used by Union Electric for disposal of combustion-related materials (ash). There is no evidence, based on contaminant data and historical information that disposal operations similar to those conducted in Northern and/or Southern Site Q ever occurred in the ash pond area within Central Site Q.

SITE Q WAS NOT APPROPRIATELY SCORED ACCORDING TO US EPA'S HAZARDOUS RANKING SYSTEM GUIDANCE.

The US EPA's scoring of Site Q involved errors that increased the HRS score. These errors included:

1. Failure to consider a removal action.
2. Incorrect delineation of wetland perimeters.
3. Assumption of endangered species presence without verification.
4. Inappropriate characterization of current site use.
5. Reliance on inappropriate sampling techniques for data collection.

1. Removal Action

The Agency has established the position that if an extended period of time elapses between site investigations and the execution of HRS scoring altered conditions at the site may be considered as long as the action physically removes waste from the site and the removed waste is disposed of properly. (Exhibit 40) Changing conditions at Site Q, principally the CERCLA time-critical removal action in 1994 (Figure 37) (Exhibit 41) and the removal in 1999 (Exhibit 42), should have been taken into account when determining the HRS score.

1996

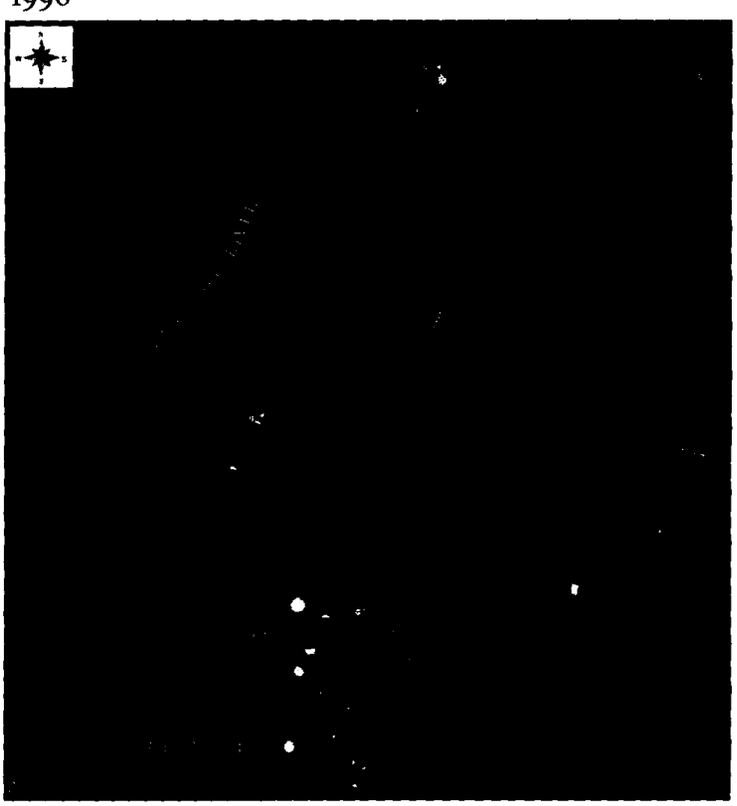


Figure 37

"For sites where the first SI was conducted more than four years prior to HRS scoring, the Agency may consider, on a case-by-case basis, changing the cut-off date to a later date. (CERCLA section 116, added by SARA, mandates that US EPA conduct site assessment work within four years of CERCLIS listing.)" (Exhibit 43, page 13)

The US EPA's use of post-remediation data (Figure 38) (Exhibit 1) demonstrates that their cutoff date for data collection is after the date of the removal action. Therefore, post-1994 data should be considered when scoring Southern Site Q.

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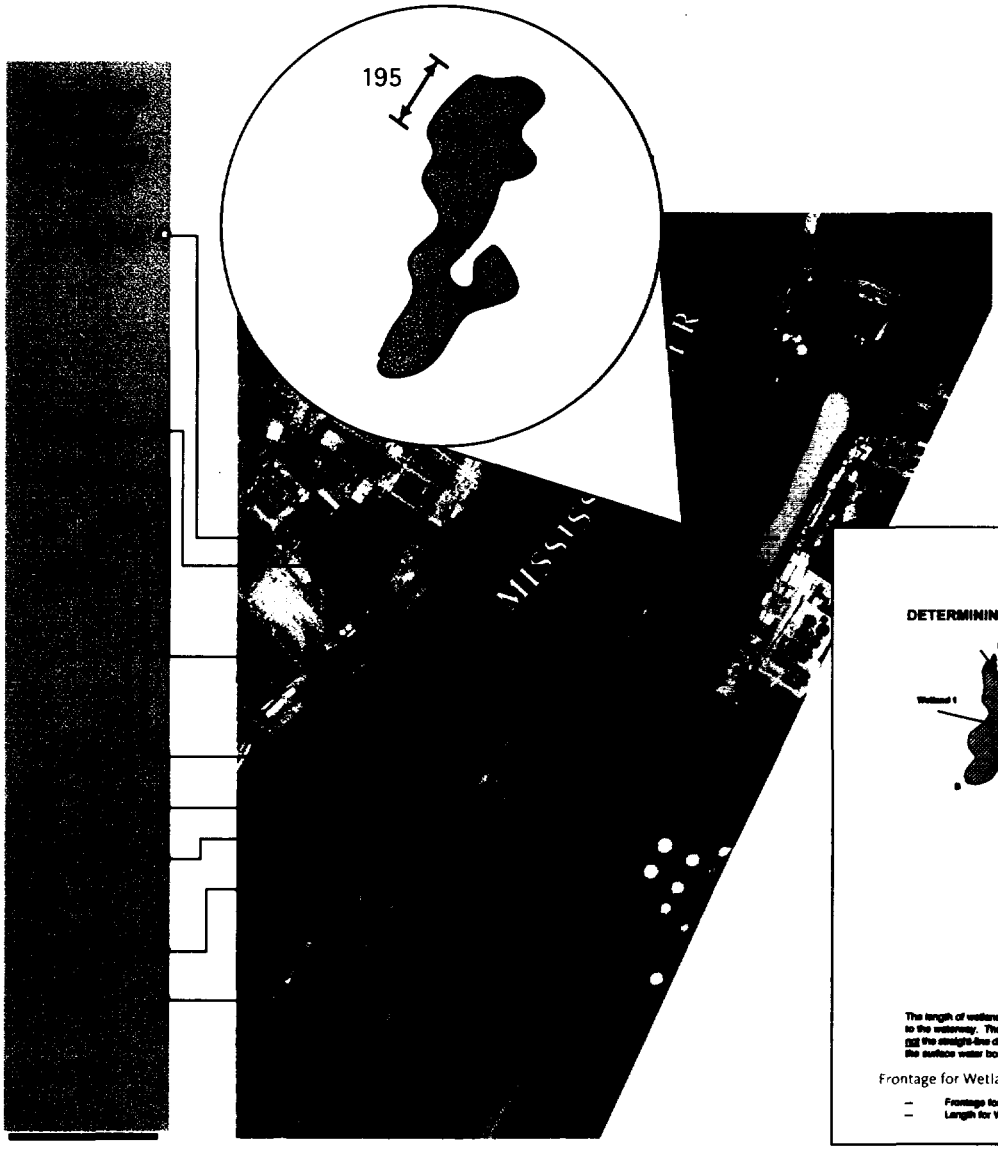
References in red were published after completion of the 1994 CERCLA time critical removal action.

Figure 38

2. Wetland Delineation

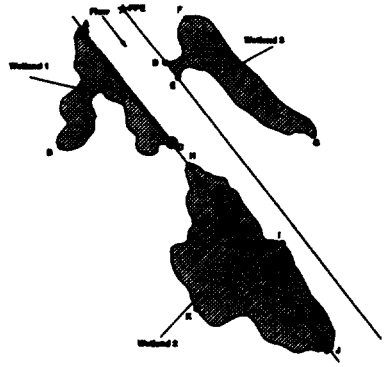
US EPA determined the extent of the target sensitive environment (wetlands) within Site Q by 1) calculating the perimeter of all wetlands regardless of frontage on the Mississippi River and by 2) calculating the entire perimeter of each small wetland in Site Q, even when their borders were contiguous which results in considering the same wetland boundaries multiple times (Figure 39). As a result of the above calculations of wetland extent, US EPA estimated the length of wetlands within Site Q as 3.6 miles rather than 1.45 miles as measured when appropriately delineated (Exhibit 31). This results in a doubling of the HRS score for potential sensitive environments. The US EPA assumes that the potential point of contaminant entry to each wetland is within the wetland itself (Figure 40). There is no evidence in Central Site Q that contamination exists which would result in a potential release of contaminants into the wetlands. There is a potential that contamination may enter the wetlands bordering the Mississippi River from sources located upstream of Site Q (particularly Site R).

Figure 39



7679.571'
(1.45 miles)

HIGHLIGHT 8-61
DETERMINING LENGTH FOR WETLANDS ALONG A RIVER



The length of wetlands along a river or stream is determined by the frontage of wetlands contiguous to the waterway. The distance should be measured as the actual shoreline (frontage) distance and not the straight-line distance between the upstream and downstream points where the wetland meets the surface water body. In this example:

Frontage for Wetland 1 is the distance A to C, not the distance A to B to C.

- Frontage for Wetland 2 is the distance H to I to J, not the distance H to J.
- Length for Wetland 3 is the distance D to E.

Figure 40

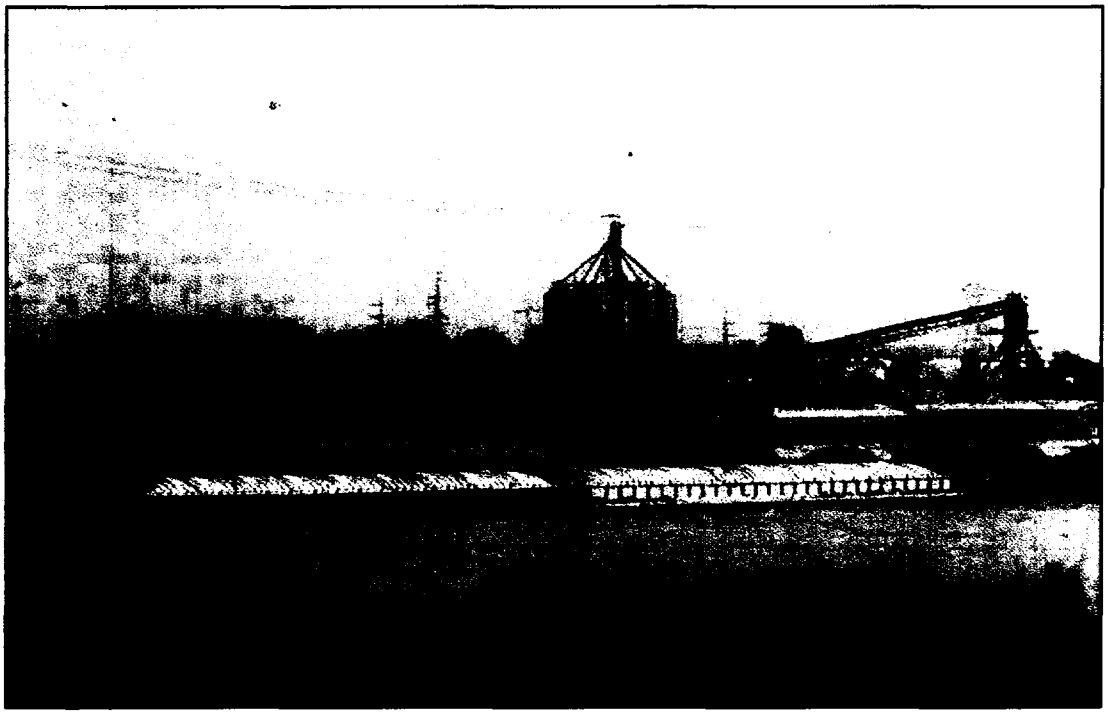
3. Endangered Species

US EPA identified six endangered species habitats located within Site Q. (Exhibit 8) An evaluation of the habitats for each of these species has been performed as well as an assessment of historical aerial photographs and current site use (Exhibit 29). Information was also obtained from the Illinois Natural History Survey in regard to threatened and endangered species that may be present in the vicinity of the site.

All the identified species require wetlands and/or large water bodies for their survival. The Bald Eagle, as well as the herons and egrets, require large trees for nesting which are not available at Site Q. The herons and egrets also require shallow water (depth of 1-50 cm) at the edge of vegetated areas for feeding. The Common Moorhen requires large expanses of cattail and bulrush for nesting, but the invasive species present in the marshy area is not generally conducive to nesting.

There is a potential for threatened and endangered species to utilize the site in some form. However, the likelihood of these species actually using the site is minimal because of the lack of breeding and feeding habitat and the commercial/industrial activities in the vicinity. At most, only one endangered speicies (the Common Moorhen) may be present at Site Q, not the six endangered species sited by US EPA. (Exhibit 29)

AUGUST 2001



View of southern Site R and Central Site Q from across the Mississippi River.

Figure 41

4. Current Site Use

Site Q has been inappropriately characterized as an inactive industrial site that is largely covered with wetlands that provide a habitat for endangered birds. (Exhibit 1) Site Q, particularly Central Site Q, has been in active commercial use since approximately 1979. (Exhibit 8)

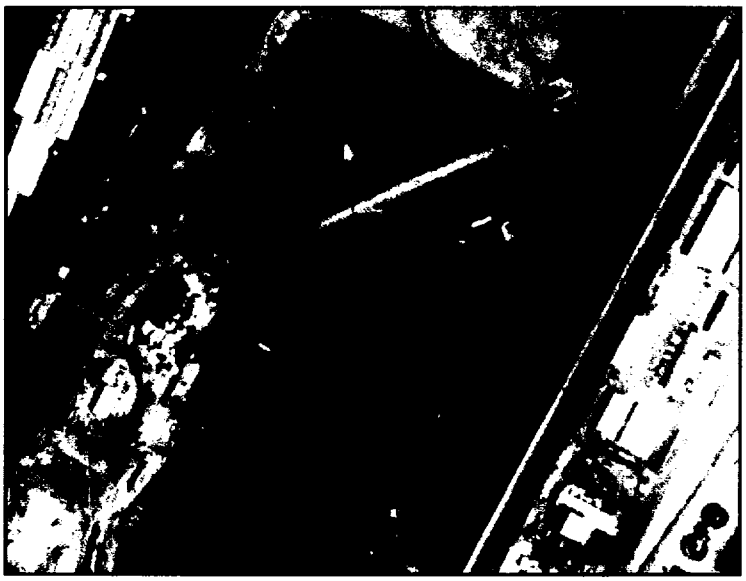


Figure 42

A large portion of Central Site Q is currently being used for a commodity unloading and transfer facility. (Exhibit 8) Large coal piles can clearly be seen on the 1996 aerial photograph (Figure 42). The Pillsbury Bulk Terminal is identified on figures provided in a 1988 IEPA document.

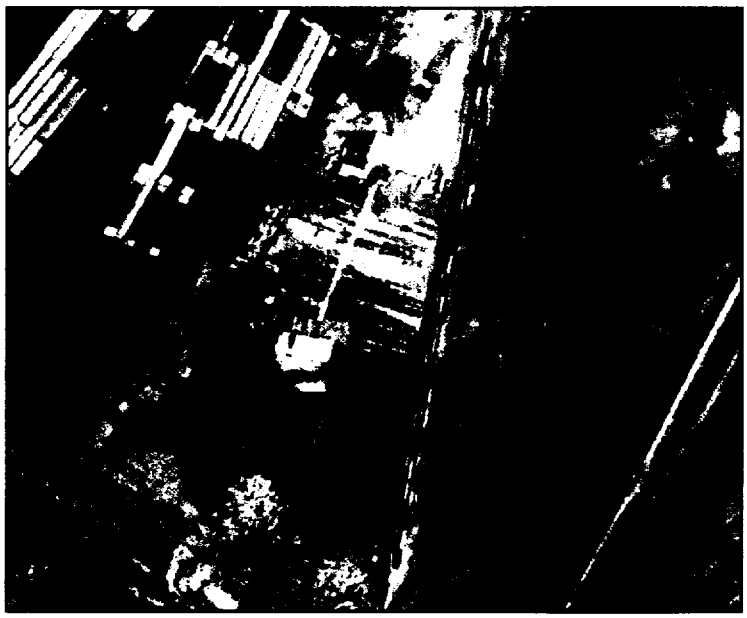


Figure 43

Large containers and other commercial equipment currently occupy the Eagle Marine facility, located within Central Site Q south of the Pillsbury Bulk Terminal (Figure 43). (Exhibit 7)

The commercial activities in Central Site Q are not conducive to maintenance of natural habitat for endangered bird species.

5 Inappropriate sampling techniques

The US EPA HRS listing document for Area 2 relied on GeoProbe® groundwater samples collected in 1999 (Exhibit 5) to characterize contamination in Site Q. (Exhibit 1) US EPA did not consider groundwater data collected from established monitoring wells in 1987 and filtered prior to analysis. (Exhibit 3)

GeoProbe® sampling techniques by their very nature can result in significant soil particulate matter being present in groundwater samples. The GeoProbe® technique does not result in the installation of well casing or allow for the development of a well prior to sampling. The lack of well development results in soil particles disturbed during the drilling technique to remain suspended in the groundwater during sample collection. These soil particles may contain contamination that is adsorbed (bound) to the soil surface. The analytical results are therefore representative of both dissolved and adsorbed contaminant concentrations.

The distinction between adsorbed and dissolved contaminant concentrations is extremely important when assessing contaminants with low water solubility and a strong affinity for organic material present in soil. Persistent environmental contaminants (PCBs and pesticides such as aldrin, dieldrin and DDT) are examples of contaminants with low water solubility and high affinity for soil adsorption. (Exhibit 39) The very basis for the persistence, and therefore the efficacy, of the pesticides is their strong adsorption to soil particles and low water solubility. (Exhibit 39) These contaminants are not typically detected as dissolved concentrations in groundwater, rather their detection is generally associated with the presence of soil particles.

The groundwater samples collected from monitoring wells (cased wells) in 1987 were filtered prior to analysis. (Exhibit 3) These samples, which are representative of dissolved concentrations, did not contain detectable concentrations of these contaminants.

PCBs, aldrin and dieldrin were attributed to Site Q based on the use of GeoProbe® sample data representative of adsorbed rather than dissolved contamination.

As shown in Figure 44, the results of the 1999 GeoProbe® sampling (locations represented in yellow) indicate the presence of PCBs, aldrin and dieldrin in groundwater. The 1987 samples (shown in red) did not detect these contaminants and are in similar locations to the 1999 samples.

For inorganics, water solubility is used as a surrogate for bioaccumulation in the HRS scoring. (Exhibit 25) Contaminants such as PCBs, pesticides and metals have low water solubility and are thus considered to be a greater threat to human health and the environment. The detection of these same contaminants in groundwater is counter-intuitive to the determination that they are not mobile in the environment and are therefore persistent.

Central Site Q should not be aggregated with Northern and Southern Site Q because there is no evidence of similar operational history throughout Site Q. The potential risks associated with Central Site Q were not evaluated in conformance with US EPA guidance and as a result, the HRS score does not appropriately reflect the potential human health and environmental risks of the site.

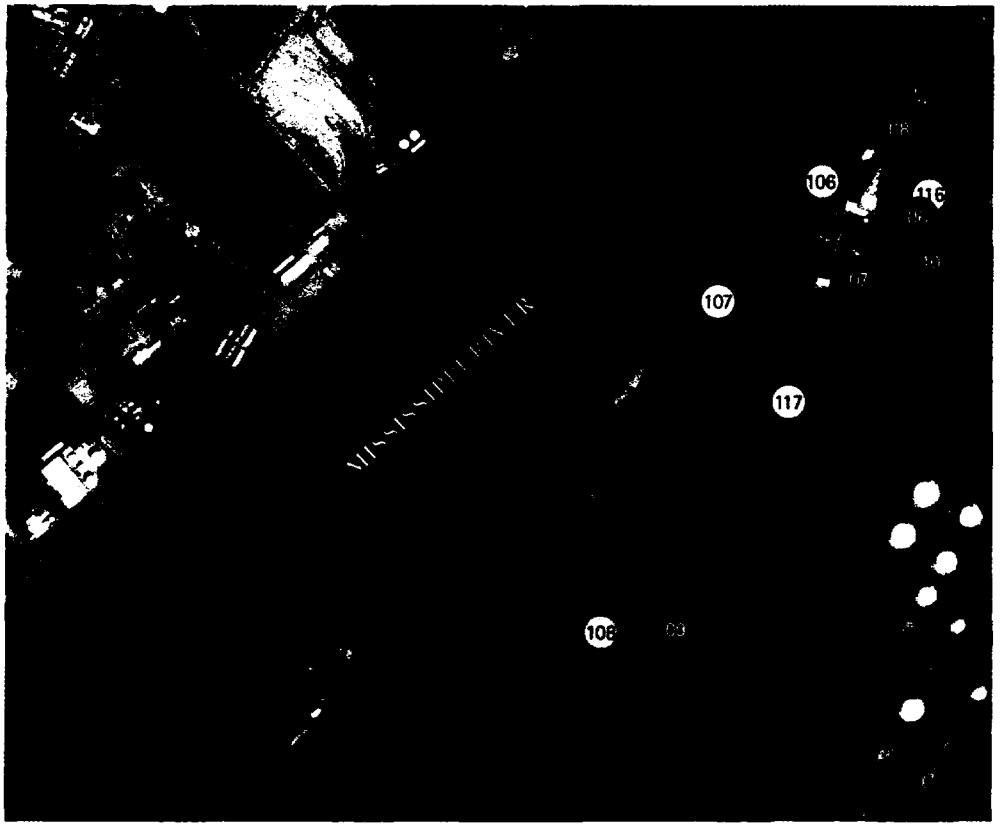


Figure 44

○ Collected May1999

	PCBs (ug/l)	Aldrin (ug/l)	Dieldrin (ug/l)
G106(99)	4.06	0.0	0.0024
G116(99)	0.0	0.12	0.0
G107(99)	82.8	0.0	0.0
G117(99)	18.9	0.72	0.0
G108(99)	1.3	0.0	0.0

● Collected March 1987

	PCBs (ug/l)	Aldrin (ug/l)	Dieldrin (ug/l)
EE-08	0.0	0.0	0.0
EE-06	0.0	0.0	0.0
EE-10	0.0	0.0	0.0
EE-07	0.0	0.0	0.0
EE-09	0.0	0.0	0.0

INDEX OF EXHIBITS

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